MLJ ENVIRONMENTAL

2019 WY Monitoring Plan Update

October 2018 – September 2019

San Joaquin County and Delta Water Quality Coalition

Central Valley Regional Water Board

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LIST OF ACRONYMS AND TERMS

C	Core site
CDEC	California Data Exchange Center
CSM	Core site monitoring
DO	Dissolved Oxygen
DPR	Department of Pesticide Regulation
MPM	Management Plan Monitoring
MPU	Monitoring Plan Update
MRP	Monitoring and Reporting Program
NM	Normal Monitoring
Order	Waste Discharge Requirements General Order R5-2012-0016 Growers within San Joaquin County and Delta Watershed
PEP	Pesticide Evaluation Protocol
pH	Power of Hydrogen
PUR	Pesticide Use Reporting
Regional Water Board	Central Valley Regional Water Quality Control Board
R	Represented site
RSM	Represented site monitoring
SC	Specific Conductivity
DWSC	Deep Water Ship Channel
SJCDWQC	San Joaquin County Delta Water Quality Coalition
TIE	Toxicity Identification Evaluation
TOC	Total Organic Carbon
TSS	Total Suspended Solids
TMDL	Total Maximum Daily Load
WQO	Water Quality Objective
WQTL	Water Quality Trigger Limit
WY	Water Year

SURFACE WATER MONITORING OVERVIEW

The San Joaquin County and Delta Water Quality Coalition (SJCDWQC or Coalition) is submitting this Monitoring Plan Update (MPU) report, which provides the monitoring schedule and justification for monitoring during the 2019 Water Year (WY), as specified in the Revised Waste Discharge Requirements General Order for Growers within the San Joaquin County and Delta Area that are Members of a Third-Party Group (No. R5-2014-0029-R1; WDR or Order). The Coalition evaluates monitoring results from the October 2017 through May 2018 to determine the 2019 WY monitoring schedule. An addendum to the 2019 WY MPU is to be submitted on January 15, 2019 to address monitoring results from June through September 2018.

NORMAL MONITORING

The Coalition conducts Normal Monitoring (NM), which includes monitoring at Core and Represented sites, to characterize discharge from irrigated agriculture. As described in the Monitoring and Reporting Program (MRP), Attachment B to the Order, the Coalition conducts monitoring at Core sites once a month which includes an assessment of field parameters, nutrients, pathogens, pesticides, metals, and toxicity to water column and sediment species. Attachment A is an Excel workbook that includes the monitoring schedule for the 2019 WY, including NM, and Special Project Monitoring.

The Coalition attempts to sample two storm events per year. A storm monitoring event is defined as monitoring within three days of a rainfall event that exceeds 0.5 inches within 24 hours.

The Coalition samples every site scheduled for monitoring; however, certain field conditions can prevent samples from being collected. If a site has no water during the scheduled sampling event, the Coalition identifies the site as 'dry' and no samples are collected. If a site does not have enough water for sample collection, the Coalition identifies the site as 'too shallow' or 'non-contiguous' (puddle-like conditions; waterbody not connected upstream or downstream) and no samples are collected (approved as Amendment to the Coalition's Quality Assurance Project Plan, herein referred to as QAPP, on April 12, 2017).

SPECIAL PROJECT MONITORING

Special Project Monitoring includes Management Plan Monitoring (MPM) and monitoring to ensure compliance with Total Maximum Daily Load (TMDL) requirements.

Management Plan Monitoring

The Coalition conducts MPM as part of the management plan strategy to identify contaminant sources and evaluate effectiveness of outreach and newly implemented management practices (SJCDWQC Surface Water Quality Management Plan or SQMP approved November 24, 2015). The flowchart in Figure 1 is used to determine which sites require focused outreach and MPM, based on the compliance schedule described in the Order (Section XII, page 37). The flowchart is used to evaluate management plans that will reach the 10-year compliance deadline in the next

three years and new management plans, or reinstated management plans, which have occurred due to exceedances in the previous water year. Table 1 includes the scenarios based on an evaluation of the strategy described in the flowchart and the monitoring decision. For any exceedances of Water Quality Trigger Limits (WQTLs) for pesticides, the Coalition conducts sourcing, outreach, and monitoring within three years from the initiation of a management plan. This schedule is based on the current number of management plans, outreach, and monitoring required in addressing the impairments in those watersheds. As the number of management plans decrease, the time needed to begin sourcing, outreach, and monitoring decreases.

Table 2 lists each site in a management plan for constituents with known agricultural sources, each constituent's compliance schedule, and the decision to conduct MPM based on the flowchart results.

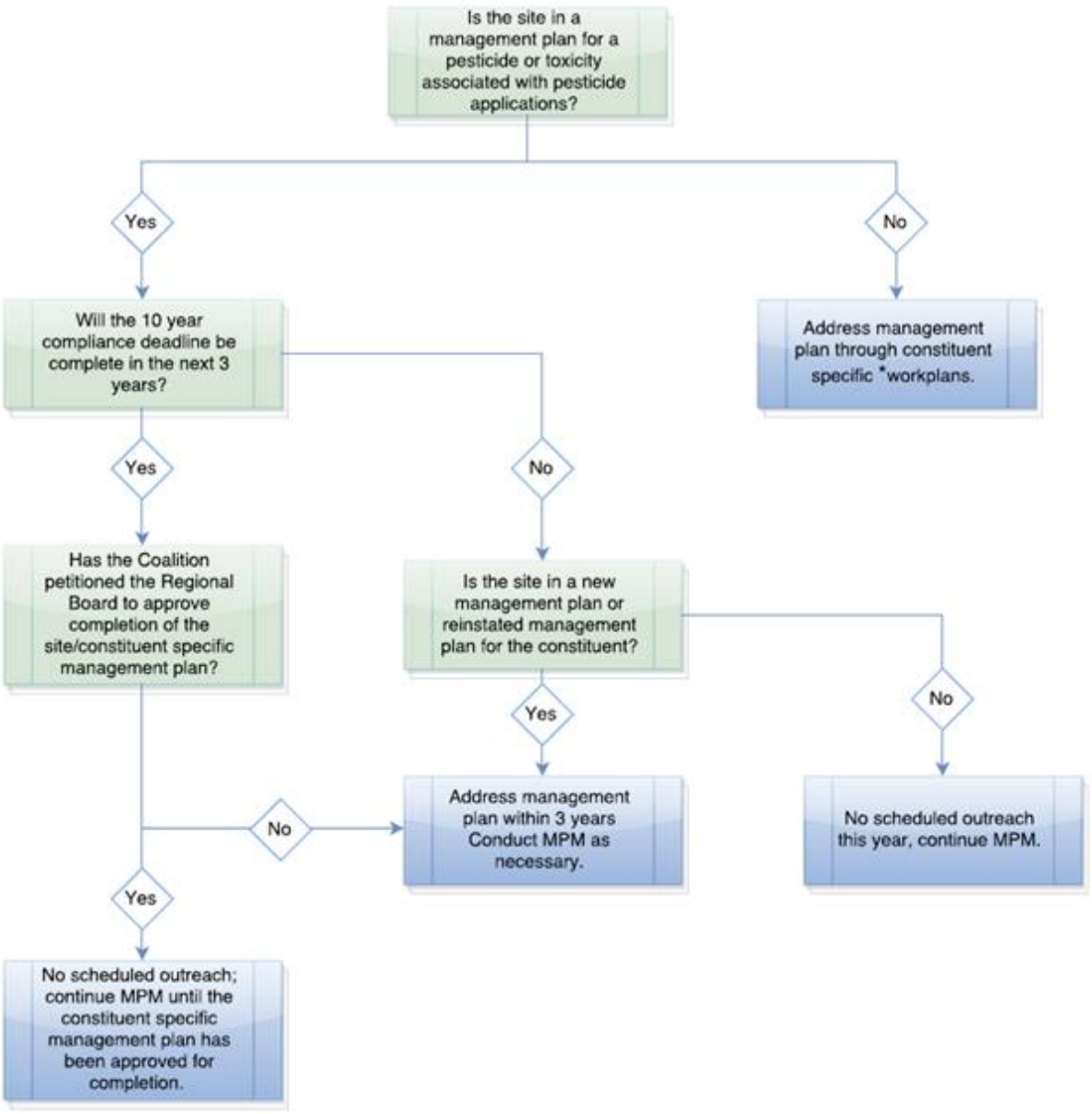
Constituents not applied by agriculture or from multiple causes outside of agriculture (ammonia, *E. coli*, field parameters, legacy pesticides, naturally occurring metals, and nitrates) cannot be easily sourced. The Coalition submitted preliminary analyses during the 2016 WY that suggested detections of these constituents were the result of natural occurrences, applied by other land uses in the Coalition region, and/or artifacts of pesticide applications that were discontinued. The impact of these sources on water quality is unknown and there is not enough evidence to suggest management practices alone will improve water quality. These constituents will not be monitored as part of MPM or evaluated in the 'Monitoring at Represented sites' section of this report. However, the Coalition will measure field parameters during all scheduled monitoring events. Table 3 lists the management plans for constituents not applied by agriculture and when the preliminary analyses were submitted.

The Coalition conducts MPM at Core sites according to the frequency outlined in Attachment B, section III.A.1, of the Order. The frequency for MPM at Represented sites is based on Pesticide Use Report (PUR) data and past exceedances. The Coalition determines the frequency of MPM at Represented sites using based on the following:

- Identify months of past exceedances for pesticides, metals, and toxicity
- Identify months of peak use and seasonal trends using PUR data and compare to water quality data

The site subwatershed sections below include: 1) a discussion of management plan constituents (pesticides, metals, and toxicity) and 2) an evaluation of monitoring frequency (based on past exceedances and PUR evaluations).

Figure 1. 2019 WY MPM decision tree.



*Work plan timelines are proposed in the SQMP (approved November 24, 2015).

Table 1. Evaluation and monitoring decisions based on the strategy outlined in the MPM decision tree.

EVALUATION	MONITORING DECISION
The 10 year deadline is not within the next three years and the management plan was initiated prior to the 2016 WY.	Continue MPM.
The 10 year deadline is not within the next three years and a management plan for pesticides or toxicity was reinstated in the 2016 WY.	Resume MPM.
Constituent was petitioned for management plan completion.	Continue MPM until approved for completion.
The 10 year deadline is not within the next three years for newly initiated management plans.	The MPM will coincide with outreach.
The 10 year deadline is within the next three years for an pesticide or toxicity.	Additional focused outreach within next three years and continue MPM.

Table 2. SJCDWQC 2019 WY MPM.

The MPM schedule is included in the Excel workbook. Sorted alphabetically by site.

SITE	CONSTITUENT	10 YR COMPLIANCE DEADLINE	2019 FOCUSED OUTREACH	2019 MPM
Bacon Island Pump @ Old River	*S. capricornutum*	2028	X	X
Drain @ Woodbridge Rd	*S. capricornutum*	2028	X	X
Duck Creek @ Hwy 4	Chlorpyrifos	2017		X
East Orwood Tract Drain	*S. capricornutum*	2026		X
Empire Tract @ 8 Mile Rd	*S. capricornutum*	2027		X
French Camp Slough @ Airport Way	Chlorpyrifos	2016		X
	Diuron	2026		X
Lone Tree Creek @ Jack Tone Rd	*P. promelas*	2019		X
Mokelumne River @ Bruella Rd	*S. capricornutum*	2026		X
Mormon Slough @ Jack Tone Rd	Chlorpyrifos	2017		X
Rindge Tract Drain	*S. capricornutum*	2029	X	X
Roberts Island @ Whiskey Slough Pump	*C. dubia*	2019		X
	S. capricornutum	2019		X
South McDonald Island Pump	*S. capricornutum*	2026	X	X
Staten Island Drain @ Staten Island Rd	*S. capricornutum*	2028		X
Terminous Tract Drain @ Hwy 12	Chlorpyrifos	2019		X
	Diuron	2026		X
	S. capricornutum	2027		X
Union Island Drain @ Bonetti Rd	Chlorpyrifos	2026		X
	C. dubia	2016		X
	S. capricornutum	2018		X
	H. azteca	2016		X
Unnamed Drain to Lone Tree Creek @ Jack Tone Rd	Chlorpyrifos	2017		X
Upper Roberts Island Drain	*C. dubia*	2026	X	X
	S. capricornutum	2027	X	X
Walthall Slough @ Woodward Ave	*S. capricornutum*	2027		X

Table 3. Management plan constituents requiring a preliminary source analysis.

Analyte	Preliminary Analysis Submittal Date	Bacon Island Pump @ Old River	Bear Creek @ North Alpine Rd	Coyote Creek Tributary @ Jack Tone Rd	Duck Creek @ Hwy 4	Drain @ Woodbridge Rd	East Orwood Tract Drain	Empire Tract @ 8 Mile Rd	French Camp Slough @ Airport Way	Jahant Slough @ Cherokee Ln	Kellogg Creek along Hoffman Ln	Littlejohns Creek @ Jack Tone Rd	Lone Tree Creek @ Jack Tone Rd	Mokelumne River @ Bruella Rd	Mormon Slough @ Jack Tone Rd	Mosher Creek @ North Alpine Rd	Pixley Slough @ Furry Rd	Roberts Island @ Whiskey Slough Pump	Rindge Tract Drain	Sand Creek @ Hwy 4 Bypass	South McDonald Island Pump	Staten Island Drain @ Staten Island Rd	Terminous Tract Drain @ Hwy 12	Union Island Drain @ Bonetti Rd	Unnamed Drain to Lone Tree Creek @ Jack Tone Rd	Upper Roberts Island Drain	Walthall Slough @ Woodward Ave
DO	2/22/2016	X	X	X	X	X	X	X	X	X		X	X		X	X	X	X	X	X	X	X	X	X	X	X	X
pH	2/22/2016	X		X							X	X	X	X	X			X							X		
SC[1]	NA	X			X	X	X	X										X	X	X	X	X	X	X		X	X
Ammonia	4/22/2016												X														
Nitrate	4/22/2016																						X				X
E. coli[2]	NA	X	X		X	X		X	X		X	X	X	X				X		X			X	X	X		X
Arsenic	3/23/2016	X				X		X															X	X			
Lead	5/20/2016																								X		
DDE	5/20/2016										X							X		X				X			
DDT	5/20/2016										X									X							

NA-Not Applicable; a preliminary analysis was not submitted in the 2016 WY.

[1]SC is being addressed by CV-SALTS which is a collaborative effort to develop and implement a salinity and nitrate management program and Basin Plan Amendment.

[2]The Coalition currently relies on existing agricultural practices to manage *E. coli* pollution pending further discussion and/or direction with the Regional Water Board regarding a region-wide management program.

Total Maximum Daily Load Monitoring

The SJCDWQC monitors for chlorpyrifos and diazinon in accordance with the Amendments to the Water Quality Control Plan for the Sacramento River and San Joaquin River Basins for the Control of Diazinon and Chlorpyrifos Runoff into the Sacramento-San Joaquin Delta (hereafter referred to as the Basin Plan Amendment) and as outlined in the compliance monitoring schedule approved on March 15, 2013.

The compliance monitoring schedule includes four Delta locations (Old River at the West End of Clifton Court Rd, San Joaquin River @ West Neugerbauer Rd, Light House Restaurant @ West Brannon Island Rd, and Walthall Slough @ Woodward Ave). Monitoring occurs once during the storm season (January through March) and monthly during the irrigation season (May through August) annually to assess compliance with loading capacity at the fours Delta sites (

Table 4). To assess compliance with load allocation, the Coalition monitors tributary sites for chlorpyrifos and diazinon. Sites monitored for load allocation include named Delta waterways and tributaries that drain to named Delta waterways from both inside and outside the legal Delta boundary are listed in Table 5. The TMDL compliance monitoring strategy focuses on periods of peak pesticide use.

To assess compliance with the DO TMDL Water Quality Objectives (WQOs), the Coalition reviews monitoring data from the California Data Exchange Center (CDEC) Rough and Ready Island station to evaluate DO concentrations in the Stockton Deep Water Ship Channel (DWSC) and assesses DO concentrations from its tributary monitoring locations.

Table 4. SJCDWQC chlorpyrifos and diazinon TMDL loading capacity sites and monitoring frequency.

Location Name	Represented Waterbody Areas	Monitoring Frequency
Walthall Slough @ Woodward Ave	San Joaquin River (Stanislaus River to Delta Boundary)	1 storm event; monthly from May through August
San Joaquin River @ West Neugerbauer Rd	Delta Waterways (Stockton Ship Channel)	1 storm event; monthly from May through August
Old River @ the West End of Clifton Court Rd	Delta Waterways (export area, southern and western portions)	1 storm event; monthly from May through August
Light House Restaurant @ West Brannon Island Rd	Delta Waterways (central and eastern portions), Mosher Slough (downstream of I-5) and Five Mile Slough (Alexandria Place to Fourteen Mile Slough)	1 storm event; monthly from May through August

Table 5. SJCDWDQC monitoring sites, as load allocation sites, and the associated Delta segments.

DELTA SEGMENT	SITE NAME	MONITORING TYPE	CONSTITUENT MONITORED
Delta eastern portion, outside legal Delta	Duck Creek @ Highway 4	CSM, MPM	C, D
	French Camp Slough @ Airport Way	MPM	C
	Mormon Slough @ Jack Tone Rd	MPM	C
	Unnamed Drain to Lone Tree Creek @ Jack Tone Rd	MPM	C
Drain to Delta waterways (eastern portion)	Terminous Tract Drain @ Hwy 12	MPM	C
Drain to Delta Waterways (central portion)	Rindge Tract Drain	RSM	C
Drain to Delta waterways (southern portion)	Union Island Drain @ Bonetti Rd	MPM	C

C – Chlorpyrifos; D - Diazinon
CSM – Core Site Monitoring.
RSM – Represented Site Monitoring.
MPM - Management Plan Monitoring.

MONITORING AT CORE SITES

The Coalition will rotate to a new set of Core sites in the 2019 WY. Table 6 includes a list of Core sites scheduled for monitoring in the 2019 WY. The Coalition will monitor the Core site in each zone for two consecutive years before rotating to the second Core site in the zone. The flowchart in Figure 2 describes the Core site monitoring strategy.

Walthall Slough @ Woodward Ave is the only monitoring location in Zone 5. Sand Creek @ Hwy 4 Bypass is the only site in Zone 6, but is neither a Core or Represented site. The Core site in Zone 4 represents water quality in Zone 6. The Coalition includes members located in Zone 6 in its evaluation for focused outreach when assessing the Zone 4 Core site.

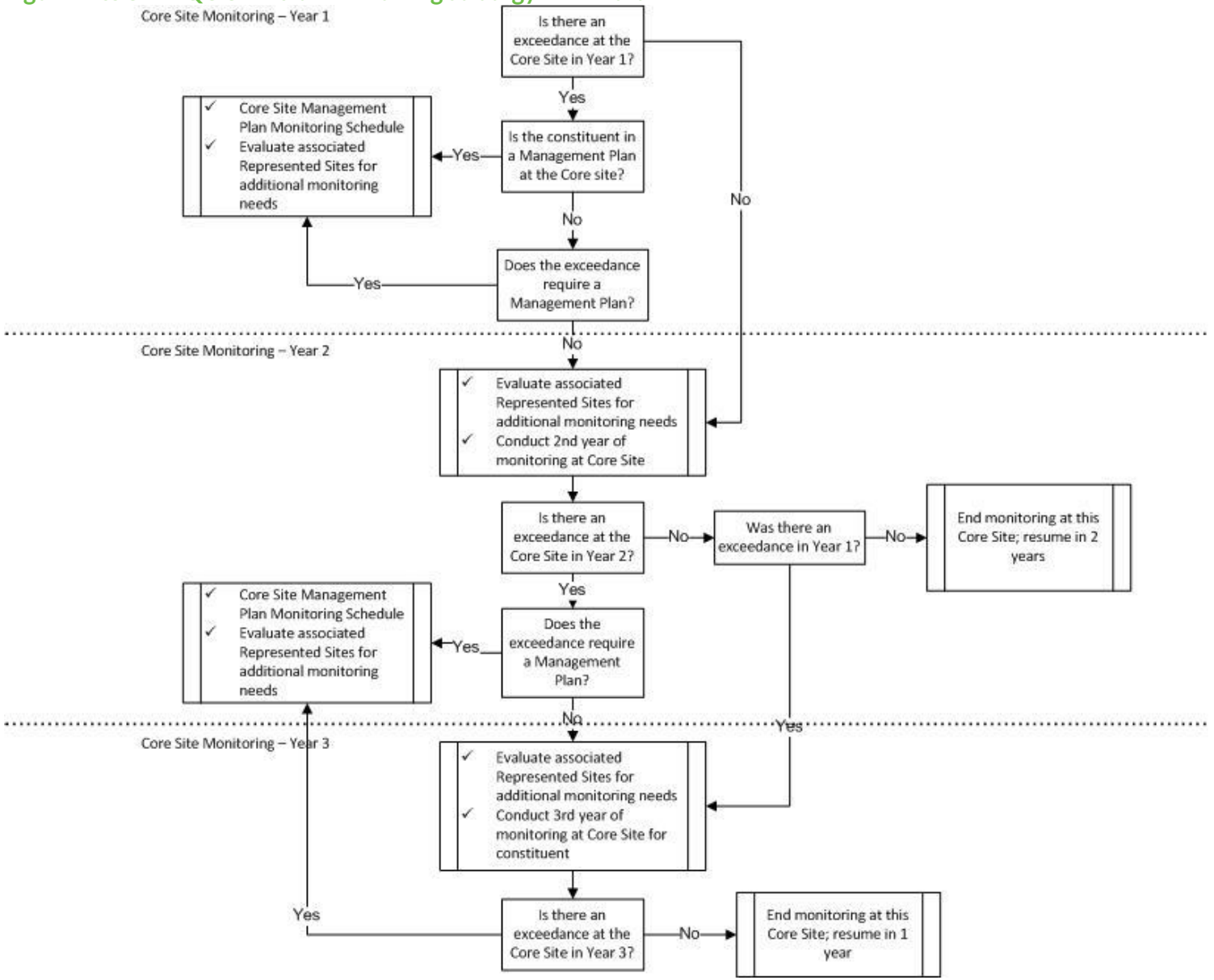
The Coalition monitors for physical parameters, nutrients, and bacteria during every sampling event at each Core site (as listed in Table 2 in Attachment B of the Order). The sections below include an evaluation of the need for monitoring for metals, pesticides, and water column and sediment toxicity by zone.

Table 6. SJCDWQC Core sites by zone.

ZONE	SITE TYPE	SITE NAME	STATION CODE	LATITUDE	LONGITUDE
1	Core	Mokelumne River @ Bruella Rd	531XMRABR	38.16010	-121.20510
2	Core	Duck Creek @ Hwy 4	531XDCAHF	37.94949	-121.18208
3	Core	Terminous Tract Drain @ Hwy 12	544XTTHWT	38.11660	-121.49360
4 and 6	Core	Roberts Island @ Whiskey Slough Pump	544RIAWSP	37.96698	-121.46366
5	Core	Walthall Slough @ Woodward Ave	544WSAWAV	37.77046	-121.52551
7	Core	Upper Roberts Island Drain	544UPRRID	37.81893	-121.35830

There is no Core site in Zone 6; water quality will be represented by the Core site in Zone 4.

Figure 2. SJCDWQC Core site monitoring strategy flowchart.



CORE SITE PESTICIDES AND TOXICITY

On November 29, 2016, the Regional Water Board issued the Pesticide Evaluation Protocol (PEP) and List of Pesticides for Third Party Groups enrolled under the WDR. The PEP is the Regional Water Board's Executive Officer (EO) mandated process for identifying pesticides with the potential to impair water quality and warrant monitoring in surface waters. The List of Pesticides (herein referred to as the EO List) includes 376 pesticides and metals that the Coalition must consider for monitoring. The SJCDWQC is providing with this document an equivalent Excel workbook (Attachment B) which documents the PEP process and the data utilized.

Figure 3 includes a flowchart that outlines the basic steps of the PEP. To implement the PEP, the Coalition acquired the past three years of PUR data (January 1, 2015 through December 31, 2017) and filtered the data to include only the chemicals on the EO list. The cumulative monthly average pounds applied, and the annual pounds applied averaged by month were calculated for each pesticide. The Coalition developed a preliminary ranking by calculating relative risk ratios which is the ratio of the amount of chemical applied (monthly average or annual use) and the aquatic life reference value for each pesticide. The Coalition then removed pesticides from the list through a series of steps involving assessing past monitoring data and the chemical properties of the pesticide. Past monitoring data were reviewed to determine if sufficient data were available, with no elevated concentrations observed, to remove the pesticide from the list. The PEP used environmental fate parameters including soil adsorption coefficient (K_{oc}), hydrolysis half-life, vapor pressure, and Henry's Law to justify excluding pesticides from monitoring. Pesticides with no identifiable analytical method were also excluded from required monitoring.

The final step of the PEP involved additional exclusions that the Coalition determined were necessary based on site specific considerations. The Coalition documented all monitoring exclusions in Attachment B for each of the Core sites. The additional exclusions applied to chemicals with:

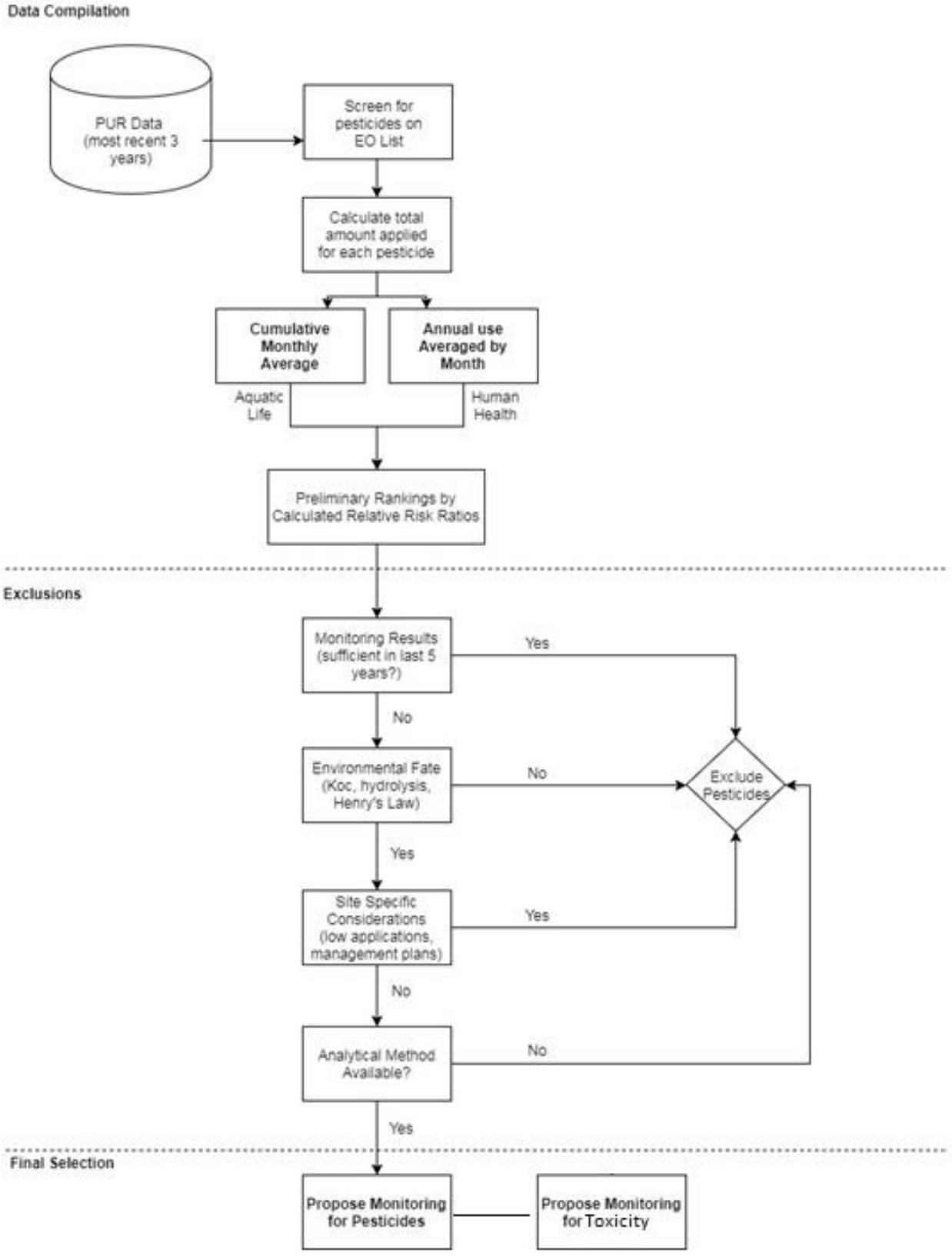
- Completed management plans
- Sufficient monitoring with no detections
- Less than a value of 50 for the aquatic life relative risk ratio
- Less than 10% average percent monthly pesticide use

Exceptions to the PEP results include MPM constituents, glyphosate, and paraquat dichloride (monitoring twice a year: once during a storm event and once during an irrigation event). The Coalition determines the irrigation monitoring event based on months of highest use; if there is no use during the irrigation season, then the Coalition will not monitor for the respective constituent during the irrigation season. The Coalition continues to conduct MPM for pesticides regardless of the outcome of the PEP. The MPM schedule for constituents at Core sites is provided for the zones they represent (Attachment A).

When the PEP results in a monitoring requirement for pyrethroids in the water column, the Coalition will also monitor for Total Organic Carbon (TOC) and Dissolved Organic Carbon (DOC) in the corresponding months.

When the PEP analyses result in no pesticides that could cause toxicity to one or more of the toxicity test species, the Coalition proposes reduced toxicity monitoring. For example, in months with no herbicide applications, the Coalition would not perform toxicity testing for *Selenastrum capricornutum*. Similarly, in months with no applications of pesticides, the Coalition would not perform toxicity testing using *Ceriodaphnia dubia*. The Coalition associates pesticides to toxicity test species based on DPR chemical type. Toxicity to *S. capricornutum* is generally associated to elevated concentrations of herbicides and copper, and toxicity to *C. dubia* is associated to insecticides. The full list of pesticides associated to toxicity test species is provided in Appendix I.

Figure 3. SJCDWQC Pesticide Evaluation Protocol flowchart.



CORE SITE METALS

Table 2 of Attachment B of the Order identifies metals that are required for consideration in the monitoring program. Past monitoring and pesticide use data were evaluated to determine if monitoring for all metals listed in the WDR should be required, and if so, the specific metals, timing, and frequency of monitoring.

To evaluate the need to monitor metals, the Coalition follows the steps in Figure 4. The first step evaluates whether the metal is a constituent responsible for a 303(d) listing of the Core site waterbody. If the metal is the cause of a 303(d) listing and there is an approved TMDL, then the Coalition will monitor based on the schedule outlined in the TMDL or determined by the Regional Water Board. There is a TMDL in place for selenium on the west side of the San Joaquin River basin and a TMDL for boron for the San Joaquin River segment between the Merced and Tuolumne Rivers. Both TMDLs are upstream and outside of Coalition boundaries. There is currently no required TMDL monitoring in the SJCDWQC for either selenium or boron. The Coalition is involved in the implementation of the methyl mercury TMDL process and will not monitor for methyl mercury until the TMDL is fully implemented.

If there is no EPA approved TMDL for the 303(d) listed metal, the Coalition reviews past monitoring data and determines if sufficient data exist to propose delisting of the waterbody. If there are not sufficient data, the Coalition will develop monitoring options as determined by the process outlined in Figure 4 for discussion with the Regional Water Board.

If a metal is not 303(d) listed for the Core site waterbody, the Coalition reviews past monitoring results to determine if the site was adequately characterized (three years of monitoring data). For dissolved metals, not all sites have three years of monitoring, but there are multiple years of monitoring for the total fraction of metals at all sites.

The goal of adequate characterization is to establish that the concentration of the metal does not exceed the hardness based WQTL at any time and therefore does not impair beneficial uses. The Coalition can use the combined history of monitoring for the total fraction and the dissolved fraction to demonstrate adequate characterization provided there are no exceedances of the hardness based WQTL for either the total or dissolved fraction of any metal.

These evaluations lead to one of the following decisions:

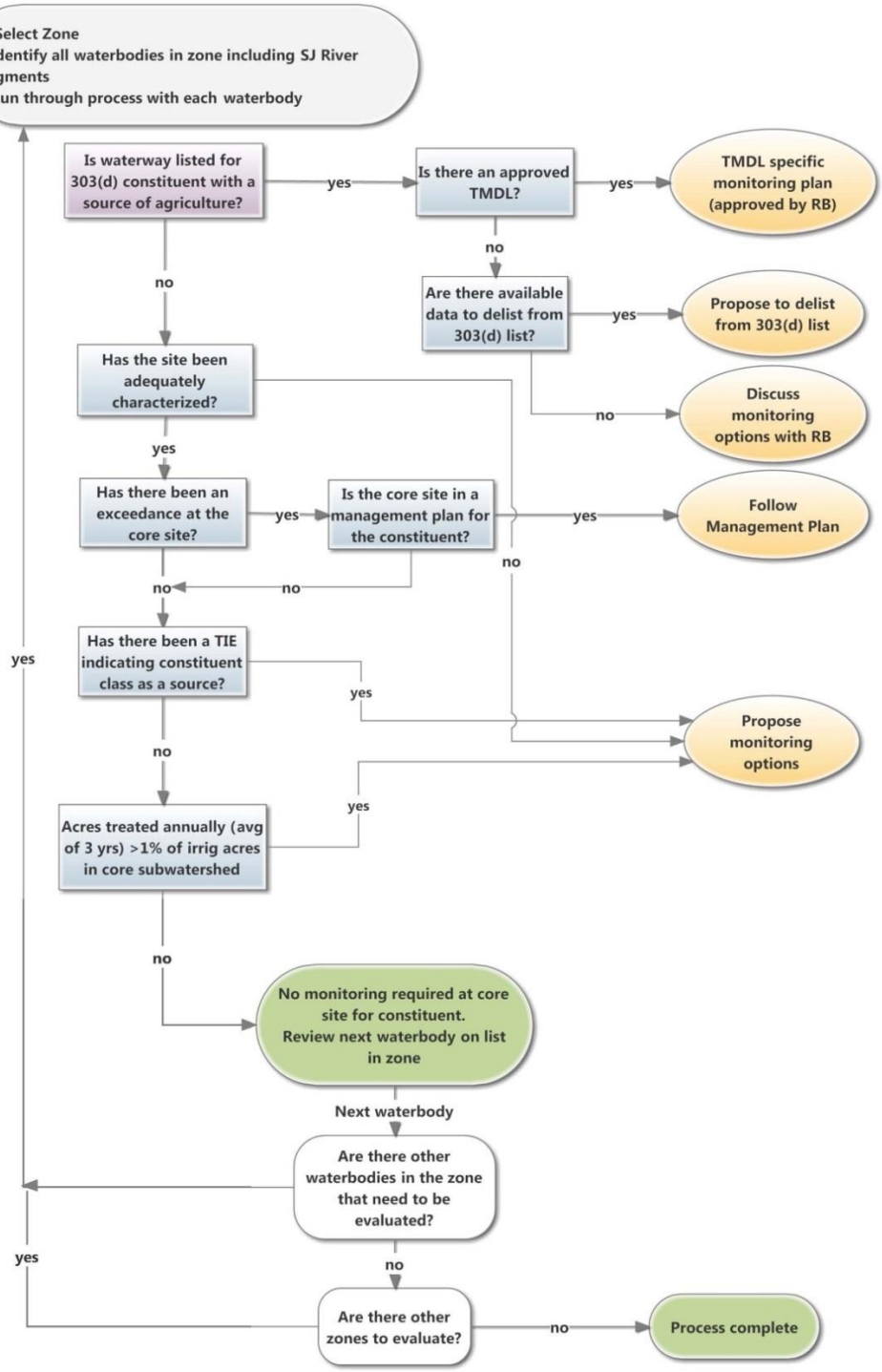
- Follow the monitoring program as described in the SJCDWQC Management Plan (characterization adequate, two or more exceedances in a three-year period).
- Develop a monitoring schedule based on past results and application data (characterization not adequate).
- No monitoring is necessary (characterization adequate, no exceedances).

If the decision tree in Figure 4 indicates that a metal should be monitored, the Coalition will monitor the total fraction for arsenic, molybdenum, and selenium; and the dissolved fraction for cadmium, lead, and nickel. Metals applied as pesticides (boron, copper, and zinc) are analyzed as part of the PEP process.

Metals applied by agriculture tend to bind to the sediment and become settled or concentrated in the bed of the waterbodies. These compounds can result in water contamination when the sediments become mobilized in the water column. The Coalition has developed a monitoring schedule of metals that includes monitoring during high total suspended solids (high TSS) irrigation and storm seasons to capture sediment-bound metals (Attachment A).

Figure 4. SJCDWQC Core site metals monitoring flowchart.

Boron, copper and zinc are evaluated through the PEP.



Mokelumne River @ Bruella Rd

Mokelumne River @ Bruella Rd is the Core site in Zone 1. The decisions for monitoring for metals at this site during the 2019 WY are outlined in Table 7. The monitoring plan is based on results from 2006 through May 2018. Metals monitoring results are listed in Table 8.

Mokelumne River, Lower (in Delta Waterways, eastern portion) is 303(d) listed for copper, zinc, and mercury.

Table 7. Results of the metals analysis for Mokelumne River @ Bruella Rd.

"X" indicates a specific monitoring decision per each constituent.

FLOWCHART QUESTION	AS	CD	PB	MO	NI	SE
1. Is site on 303(d) list for constituent?	No	No	No	No	No	No
2. Has the site been adequately characterized?	Yes	Yes	Yes	Yes	Yes	Yes
3. Has there been an exceedance?	No	No	No	No	No	No
4. Is waterbody in a management plan for constituent?	No	No	No	No	No	No
5. Has there been a TIE indicating the constituent class as causal agent?	No	No	No	No	No	No
6. Acres treated > 1%?	No	No	No	No	No	No
Monitoring Decision						
1. TMDL-specific monitoring						
2. Propose to delist from 303(d) list						
3. Monitoring according to management plan						
4. Propose monitoring plan in MPU analysis below						
5. No monitoring during the 2019 WY	X	X	X	X	X	X

Monitoring Decision #5 - No monitoring

Total Arsenic, Dissolved Cadmium, Dissolved Lead, Total Molybdenum, Dissolved Nickel, and Total Selenium

The Coalition monitored for all metals at Mokelumne River @ Bruella Rd from 2006 through 2008, 2011, and 2014 and the site is considered fully characterized. Past monitoring data indicate no exceedances occurred for any of the WQTLs for these metals. Figure 4 indicates no monitoring (Monitoring Decision #5 of Table 7) at Mokelumne River @ Bruella Rd is required for arsenic, cadmium, lead, molybdenum, nickel, or selenium.

Table 8. Mokelumne River @ Bruella Rd site subwatershed dissolved and total metals monitoring results (2006 - May 2018).

Year	As, Total (µg/L)	Cd, Dissolved (µg/L)	Cd, Total (µg/L)	Pb, Dissolved (µg/L)	Pb, Total (µg/L)	Mo, Total (µg/L)	Ni, Dissolved (µg/L)	Ni, Total (µg/L)	Se, Total (µg/L)
Samples collected in 2006	5	0	5	0	5	5	0	5	5
Samples collected in 2007	8	0	8	0	8	8	0	8	4
Samples collected in 2008	7	0	7	0	7	0	0	7	7
Samples collected in 2009	0	0	0	0	0	0	0	0	0
Samples collected in 2010	0	0	0	0	0	0	0	0	0
Samples collected in 2011	12	12	12	12	12	12	12	12	12
Samples collected in 2012	0	0	0	0	0	0	0	0	0
Samples collected in 2013	0	0	0	0	0	0	0	0	0
Samples collected in 2014	9	9	9	9	9	9	9	9	9
Samples collected in 2015 WY[1]	0	0	0	0	0	0	0	0	0
Samples collected in 2016 WY	0	0	0	0	0	0	0	0	0
Samples collected in 2017 WY	0	0	0	0	0	0	0	0	0
Samples collected in 2018 WY[2]	0	0	0	0	0	0	0	0	0
Total Samples Collected	41	21	41	21	41	41	21	41	37
Total Exceedances	0	0	0	0	0	0	0	0	0
% Exceedances	0%	0%	0%	0%	0%	0%	0%	0%	0%

[1]The Coalition began monitoring based on a WY in the 2015 WY.
[2]Monitoring data through May 2018 only.
NA- Not applicable.

Duck Creek @ Hwy 4

Duck Creek @ Hwy 4 is the Core site in Zone 2. The decisions for monitoring for metals at this site during the 2019 WY are outlined in Table 9. The monitoring plan is based on results from 2008 through 2012. Metals monitoring results are listed in Table 10.

Duck Creek (San Joaquin County) is 303(d) listed for mercury.

Table 9. Results of the metals analysis for Duck Creek @ Hwy 4.

"X" indicates a specific monitoring decision per each constituent.

FLOWCHART QUESTION	AS	CD	PB	MO	NI	SE
1. Is site on 303(d) list for constituent?	No	No	No	No	No	No
2. Has the site been adequately characterized?	Yes	Yes	Yes	Yes	Yes	Yes
3. Has there been an exceedance?	No	No	No	No	No	No
4. Is waterbody in a management plan for constituent?	No	No	No	No	No	No
5. Has there been a TIE indicating the constituent class as causal agent?	No	No	No	No	No	No
6. Acres treated > 1%?	No	No	No	No	No	No
Monitoring Decision						
1. TMDL-specific monitoring						
2. Propose to delist from 303(d) list						
3. Monitoring according to management plan						
4. Propose monitoring plan in MPU analysis below						
5. No monitoring during the 2019 WY	X	X	X	X	X	X

Monitoring Decision #5 - No monitoring

Total Arsenic, Dissolved Cadmium, Dissolved Lead, Total Molybdenum, Dissolved Nickel, and Total Selenium

The Coalition monitored for all metals at Duck Creek @ Hwy 4 in 2008, 2009, and 2012 and the site is considered fully characterized. Past monitoring data indicate no exceedances occurred for any of the WQTLs for these metals. Figure 4 indicates that no monitoring (Monitoring Decision #5 of Table 7) at Duck Creek @ Hwy 4 is required for arsenic, cadmium, lead, molybdenum, nickel, or selenium.

Table 10. Duck Creek @ Hwy 4 site subwatershed dissolved and total metals monitoring results (2009 - May 2018).

Year	As, Total (µg/L)	Cd, Dissolved (µg/L)	Cd, Total (µg/L)	Pb, Dissolved (µg/L)	Pb, Total (µg/L)	Mo, Total (µg/L)	Ni, Dissolved (µg/L)	Ni, Total (µg/L)	Se, Total (µg/L)
Samples collected in 2008	9	0	2	0	9	3	3	9	3
Samples collected in 2009	3	0	3	1	3	3	3	3	2
Samples collected in 2010	0	0	0	0	0	0	0	0	0
Samples collected in 2011	0	0	0	0	0	0	0	0	0
Samples collected in 2012	12	0	2	10	12	12	12	12	8
Samples collected in 2013	0	0	0	0	0	0	0	0	0
Samples collected in 2014	0	0	0	0	0	0	0	0	0
Samples collected in 2015 WY[1]	0	0	0	0	0	0	0	0	0
Samples collected in 2016 WY	0	0	0	0	0	0	0	0	0
Samples collected in 2017 WY	0	0	0	0	0	0	0	0	0
Samples collected in 2018 WY[2]	0	0	0	0	0	0	0	0	0
Total Collected	24	0	7	11	24	18	18	24	13
Total Exceedances	0	0	0	0	0	0	0	0	0
% Exceedances	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

[1]The Coalition began monitoring based on a WY in the 2015 WY.
[2]Monitoring data through May 2018 only.
NA- Not applicable.

Terminous Tract Drain @ Hwy 12

Terminous Tract Drain @ Hwy 12 is the Core site in Zone 3. The decisions for monitoring for metals at this site during the 2019 WY are outlined in Table 11. The monitoring plan is based on results from 2006 through May 2018. Metals monitoring results are listed in Table 12.

The Delta Waterways (central portion) is 303(d) listed for mercury.

Table 11. Results of the metals analysis for Terminous Tract Drain @ Hwy 12

"X" indicates a specific monitoring decision per each constituent.

FLOWCHART QUESTION	AS	CD	PB	MO	NI	SE
1. Is site on 303(d) list for constituent?	No	No	No	No	No	No
2. Has the site been adequately characterized?	Yes	Yes	Yes	Yes	Yes	Yes
3. Has there been an exceedance?	Yes	No	No	No	No	No
4. Is waterbody in a management plan for constituent?	Yes	No	No	No	No	No
5. Has there been a TIE indicating the constituent class as causal agent?	No	No	No	No	No	No
6. Acres treated > 1%?	No	No	No	No	No	No
Monitoring Decision						
1. TMDL-specific monitoring						
2. Propose to delist from 303(d) list						
3. Monitoring according to management plan	X					
4. Propose monitoring plan in MPU analysis below						
5. No monitoring during the 2019 WY		X	X	X	X	X

Monitoring Decision #3- Monitoring according to management plan

Total Arsenic

Since monitoring began in this site subwatershed, there have been a total of eight exceedances of the WQTL for arsenic and therefore the site was placed in a management plan (Table 12). However, the Coalition does not conduct MPM for metals not applied by agriculture such as arsenic. Additionally, the Coalition has analyzed 67 samples for arsenic in this site subwatershed; Terminous Tract Drain @ Hwy 12 is considered adequately characterized. Therefore, the Coalition will not monitor for arsenic in the 2019 WY.

Monitoring Decision #5 - No monitoring

Dissolved Cadmium, Dissolved Lead, Total Molybdenum, Dissolved Nickel, and Total Selenium

The Coalition monitored for all metals at Terminous Tract Drain @ Hwy 12 from 2006 through 2008, 2010, and 2013 and is considered fully characterized. Past monitoring data indicate no exceedances occurred for any of the WQTLs for these metals (Table 12). Figure 4 indicates no monitoring (Monitoring Decision #5 of Table 11) is required at the site for cadmium, lead, molybdenum, nickel, and selenium.

Table 12. Terminous Tract Drain @ Hwy 12 site subwatershed dissolved and total metals monitoring results (2006 - May 2018).

Year	As, Total (µg/L)	Cd, Dissolved (µg/L)	Cd, Total (µg/L)	Pb, Dissolved (µg/L)	Pb, Total (µg/L)	Mo, Total (µg/L)	Ni, Dissolved (µg/L)	Ni, Total (µg/L)	Se, Total (µg/L)
Samples collected in 2006	5	0	5	0	5	0	0	5	5
Samples collected in 2007	8	0	8	0	8	0	0	8	4
Samples collected in 2008	7	0	7	0	7	0	0	7	7
Samples collected in 2009	0	0	0	0	0	0	0	0	0
Samples collected in 2010	12	12	12	12	12	12	12	12	12
Samples collected in 2011	0	0	0	0	0	0	0	0	0
Samples collected in 2012	0	0	0	0	0	0	0	0	0
Samples collected in 2013	12	12	12	12	12	12	12	12	12
Samples collected in 2014	0	0	0	0	0	0	0	0	0
Samples collected in 2015 WY[1]	9	0	0	0	0	0	0	0	0
Samples collected in 2016 WY	12	0	0	0	0	0	0	0	0
Samples collected in 2017 WY	4	0	0	0	0	0	0	0	0
Samples collected in 2018 WY[2]	0	0	0	0	0	0	0	0	0
Total Collected	69	24	44	24	44	24	24	44	40
Total Exceedances	8	0	0	0	0	0	0	0	0
% Exceedances	11.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

[1]The Coalition began monitoring based on a WY in the 2015 WY.
[2]Monitoring data through May 2018 only.
NA- Not applicable.

Roberts Island @ Whiskey Slough Pump

Roberts Island @ Whiskey Slough Pump is the Core site in Zone 4. The decisions for monitoring for metals at this site during the 2019 WY are outlined in Table 13. The monitoring plan is based on results from 2008 through May 2018. Metals monitoring results are listed in Table 14.

The Delta Waterways (central portion) is 303(d) listed for mercury.

Table 13. Results of the metals analysis for Roberts Island @ Whiskey Slough Pump.
"X" indicates a specific monitoring decision per each constituent.

FLOWCHART QUESTION	AS	CD	PB	MO	NI	SE
1. Is site on 303(d) list for constituent?	No	No	No	No	No	No
2. Has the site been adequately characterized?	Yes	Yes	Yes	Yes	Yes	Yes
3. Has there been an exceedance?	Yes	No	No	No	No	No
4. Is waterbody in a management plan for constituent?	No	No	No	No	No	No
5. Has there been a TIE indicating the constituent class as causal agent?	No	No	No	No	No	No
6. Acres treated > 1%?	No	No	No	No	No	No
Monitoring Decision						
1. TMDL-specific monitoring						
2. Propose to delist from 303(d) list						
3. Monitoring according to management plan						
4. Propose monitoring plan in MPU analysis below	X					
5. No monitoring during the 2019 WY		X	X	X	X	X

Monitoring Decision #4 – Propose monitoring plan

Total Arsenic

Since monitoring began in this site subwatershed, there have been a total of three exceedances of the WQTL for arsenic, two of which were from upstream and inactive monitoring locations (Table 12). The Coalition does not conduct MPM for metals not applied by agriculture such as arsenic. Additionally, the Coalition has analyzed 38 samples for arsenic in this site subwatershed; Roberts Island @ Whiskey Slough Pump is considered adequately characterized. Therefore, the Coalition will not monitor for arsenic in the 2019 WY.

Monitoring Decision #5 - No monitoring

Total and Dissolved Cadmium, Total Copper, Total and Dissolved Lead, Total Molybdenum, Total and Dissolved Nickel, and Total Selenium

The Coalition monitored for all metals at Terminous Tract Drain @ Hwy 12 in 2008, 2010, and 2013 and is considered fully characterized. Past monitoring data indicate no exceedances of the WQTLs for these metals (Table 14). Figure 4 indicates no monitoring (Monitoring Decision #5 of Table 11) is required at the site for cadmium, lead, molybdenum, nickel, and selenium.

Table 14. Roberts Island @ Whiskey Slough Pump site subwatershed dissolved and total metals monitoring results (2014 – May 2018).

Monitoring data prior to 2014 are from past upstream sites on Roberts Island.

Year	As, Total (µg/L)	Cd, Dissolved (µg/L)	Cd, Total (µg/L)	Pb, Dissolved (µg/L)	Pb, Total (µg/L)	Mo, Total (µg/L)	Ni, Dissolved (µg/L)	Ni, Total (µg/L)	Se, Total (µg/L)
Samples collected in 2008	6	0	6	0	6	0	0	6	6
Samples collected in 2009	0	0	0	0	0	0	0	0	0
Samples collected in 2010	0	0	0	0	0	0	0	0	0
Samples collected in 2011	12	12	12	12	12	12	12	12	12
Samples collected in 2012	0	0	0	0	0	0	0	0	0
Samples collected in 2013	0	0	0	0	0	0	0	0	0
Samples collected in 2014	12	3	3	3	3	3	3	3	3
Samples collected in 2015 WY[1]	4	0	0	0	0	0	0	0	0
Samples collected in 2016 WY	4	0	0	0	0	0	0	0	0
Samples collected in 2017 WY	0	0	0	0	0	0	0	0	0
Samples collected in 2018 WY[2]	0	0	0	0	0	0	0	0	0
Total Collected	38	15	21	15	21	15	15	21	21
Total Exceedances	3	0	0	0	0	0	0	0	0
% Exceedances	7.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

[1]The Coalition began monitoring based on a WY in the 2015 WY.
[2]Monitoring data through May 2018 only.

NA- Not applicable.

Walthall Slough @ Woodward Ave

Walthall Slough @ Woodward Ave is the Core site in Zone 5. The decisions for monitoring for metals at this site during the 2019 WY are outlined in Table 15. The monitoring plan is based on results from 2009 through May 2018. Metals monitoring results are listed in Table 16.

Walthall Slough @ Woodward Ave is not listed as an impaired waterbody on California's 303(d) List of Impaired Waterbodies.

Table 15. Results of the metals analysis for Walthall Slough @ Woodward Ave.

"X" indicates a specific monitoring decision per each constituent.

FLOWCHART QUESTION	AS	CD	PB	MO	NI	SE
1. Is site on 303(d) list for constituent?	No	No	No	No	No	No
2. Has the site been adequately characterized?	Yes	Yes	Yes	Yes	Yes	Yes
3. Has there been an exceedance?	No	No	No	No	No	No
4. Is waterbody in a management plan for constituent?	No	No	No	No	No	No
5. Has there been a TIE indicating the constituent class as causal agent?	No	No	No	No	No	No
6. Acres treated > 1%?	No	No	No	No	No	No
Monitoring Decision						
1. TMDL-specific monitoring						
2. Propose to delist from 303(d) list						
3. Monitoring according to management plan						
4. Propose monitoring plan in MPU analysis below						
5. No monitoring during the 2019 WY	X	X	X	X	X	X

Monitoring Decision #5 - No monitoring

Total Arsenic, Dissolved Cadmium, Dissolved Lead, Total Molybdenum, Dissolved Nickel, and Total Selenium

The Coalition monitored for all metals at Walthall Slough @ Woodward Ave in 2009, 2010, and 2013 and the site is considered fully characterized. Past monitoring history indicated no exceedances of the WQTLs for any of these metals (Table 16). Figure 4 indicates no monitoring (Monitoring Decision #5 of Table 15) at Walthall Slough @ Woodward Ave is required for arsenic, cadmium, lead, molybdenum, nickel, or selenium.

Table 16. Walthall Slough @ Woodward Ave site subwatershed dissolved and total metals monitoring results (2009 – May 2017).

Year	As, Total (µg/L)	Cd, Dissolved (µg/L)	Cd, Total (µg/L)	Pb, Dissolved (µg/L)	Pb, Total (µg/L)	Mo, Total (µg/L)	Ni, Dissolved (µg/L)	Ni, Total (µg/L)	Se, Total (µg/L)
Samples collected in 2009	12	12	12	12	12	12	12	12	12
Samples collected in 2010	12	12	12	12	12	12	12	12	12
Samples collected in 2011	0	0	0	0	0	0	0	0	0
Samples collected in 2012	0	0	0	0	0	0	0	0	0
Samples collected in 2013	12	12	12	12	12	12	12	12	12
Samples collected in 2014	0	0	0	0	0	0	0	0	0
Samples collected in 2015 WY[1]	0	0	0	0	0	0	0	0	0
Samples collected in 2016 WY	0	0	0	0	0	0	0	0	0
Samples collected in 2017 WY	0	0	0	0	0	0	0	0	0
Samples collected in 2018 WY[2]	0	0	0	0	0	0	0	0	0
Total Samples Collected	36	36	36	36	36	36	36	36	36
Total Exceedances	0	0	0	0	0	0	0	0	0
% Exceedances	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

[1]The Coalition began monitoring based on a WY in the 2015 WY.
[2]Monitoring data through May 2018 only.
NA- Not applicable.

Upper Roberts Island Drain

Upper Roberts Island Drain is the Core site in Zone 7. The decisions for monitoring for metals at this site during the 2019 WY are outlined in Table 17. The 2019 WY is the first time the Coalition will monitor for metals at this site.

Upper Roberts Island Drain is not listed as an impaired waterbody on California's 303(d) List of Impaired Waterbodies.

Table 17. Results of the metals analysis for Upper Roberts Island Drain.
"X" indicates a specific monitoring decision per each constituent.

FLOWCHART QUESTION	AS	CD	PB	MO	NI	SE
1. Is site on 303(d) list for constituent?	No	No	No	No	No	No
2. Has the site been adequately characterized?	No	No	No	No	No	No
3. Has there been an exceedance?	No	No	No	No	No	No
4. Is waterbody in a management plan for constituent?	No	No	No	No	No	No
5. Has there been a TIE indicating the constituent class as causal agent?	No	No	No	No	No	No
6. Acres treated > 1%?	No	No	No	No	No	No
Monitoring Decision						
1. TMDL-specific monitoring						
2. Propose to delist from 303(d) list						
3. Monitoring according to management plan						
4. Propose monitoring plan in MPU analysis below	X	X	X	X	X	X
5. No monitoring during the 2019 WY						

Monitoring Decision #4 – Propose monitoring plan

Total Arsenic, Dissolved Cadmium, Dissolved Lead, Total Molybdenum, Dissolved Nickel, and Total Selenium

The Coalition has not monitored for any metals at Upper Roberts Island Drain. Upper Roberts Island Drain was added to the SJCDWQC monitoring plan during the 2015 WY as a Represented Site and will rotate to a Core site starting with the 2019 WY. During the 2019 WY, the Coalition will monitor for total arsenic, dissolved cadmium, dissolved lead, total molybdenum, dissolved nickel, and total selenium to better characterize this site subwatershed. Monitoring will be scheduled during four high TSS monitoring events (two storm and two irrigation).

DELTA RMP REDUCED MONITORING

The goal of the Delta Regional Monitoring Program (RMP) is to develop comprehensive and coordinated monitoring efforts among the many entities that currently conduct monitoring in the Delta, including the SJCDWQC. Based on the success of similar programs, it is anticipated that this effort will lead to opportunities to fill data gaps related to contaminants, water quality impairments, aquatic health, and reduce redundant monitoring efforts and cost.

The Coalition evaluated monitoring data for water column toxicity to *P. promelas* to determine potential monitoring reductions to account for the Coalition's contributions to the Delta RMP. The primary considerations used to determine monitoring reductions included 1) sufficient monitoring history, 20 or more samples per site (Core and Represented), and 2) no toxicity within the past five years. For the 2019 WY, the Coalition will not monitor for water column toxicity to *P. promelas* at any sampling locations (Core, Represented, or MPM sites).

MONITORING AT REPRESENTED SITES

During the 2019 WY, the Coalition has considered monitoring at 19 of the 20 Represented sites; Mokelumne River Drain @ North Lower Sacramento Rd is the only site not considered for monitoring (represented by the Core site for Zone 1). Sites marked "to be determined" (TBD) for Delta Zones 3, 4, and 7 in Table 1 of Attachment B of the Order are specified for the 2019 WY in Table 18. The Coalition evaluated potential monitoring locations that represent the hydrological units (HUC-12) within each of these zones. Monitoring locations in the Delta were selected based on the following criteria:

- The drain has a pump that removes water from the island
- The monitoring location is accessible year-around (e.g. the road accessing the site is traversable during storm events)

Some sites represent more than one HUC-12 because of these criteria. As described later in this section, Union Island Drain @ Bonetti Rd represents the Town of French Camp – San Joaquin River HUC-12. Table 18 lists all the Core and Represented sites, the HUC-12 represented by the site, the site name, station code, and monitoring site coordinates for the 2019 WY.

Table 18. SJCDWQC 2019 WY Core, Represented, and Hydrological Unit Code-12 (HUC-12) sites.

Core site information is bolded.

Zone	Site Type	Site Name	HUC-12	Station Code	Latitude	Longitude
1	**Core**	**Mokelumne River @ Bruella Rd**		**531XMRABR**	**38.16022**	**-121.20643**
1	Represented	Bear Creek @ North Alpine Rd	Lower Bear Creek / Murphy Creek-Mokelumne River[1]	531BCANAR	38.07386	-121.21215
1	Represented	Coyote Creek Tributary @ Jack Tone Rd	Coyote Creek	531CCTALR	38.24082	-121.15200
1	Represented	Jahant Slough @ Cherokee Ln	Jahant Slough	531XJSACL	38.21035	-121.26200
1	Represented	Mosher Creek @ North Alpine Rd	Mosher Creek	531MCANAR	38.06088	-121.20900
1	Represented	Pixley Slough @ Furry Rd	Pixley Slough	531XPSAFR	38.08256	-121.24100
2	**Core**	**Duck Creek @ Hwy 4**	**Lower Duck Creek**	**531XDCAHF**	**37.94949**	**-121.18208**
2	Represented	French Camp Slough @ Airport Way		531SJC504	37.88172	-121.24933
2	Represented	Littlejohns Creek @ Jack Tone Rd	Simmons Creek-Littlejohns Creek	531XLCAJR	37.88958	-121.14727
2	Represented	Lone Tree Creek @ Jack Tone Rd	Middle Lone Tree Creek	531XLTCJR	37.83754	-121.14460
2	Represented	Mormon Slough @ Jack Tone Rd	McLeod Lake-Mormon Slough	544MSAJTR	37.96470	-121.14880
2	Represented	Unnamed Drain to Lone Tree Creek @ Jack Tone Rd	Lower Lone Tree Creek	531UDLTAJ	37.85360	-121.14570
3	**Core**	**Terminous Tract Drain @ Hwy 12**		**544XTTHWT**	**38.11558**	**-121.49380**
3	Represented	Drain @ Woodbridge Rd	Hog Slough	544DAWRXX	38.15256	-121.50095
3	Represented	Empire Tract @ 8 Mile Rd	Venice Island-Little Connection Slough	544ETAEMR	38.06012	-121.49912
3	Represented	Rindge Tract Drain	Fivemile Creek-San Joaquin River	544RDGTRD	38.04553	-121.46933
3	Represented	Staten Island Drain @ Staten Island Rd	South Mokelumne River-Mokelumne River	544SIDSIR	38.13297	-121.52225
4	**Core**	**Roberts Island @ Whiskey Slough Pump**		**544RIAWSP**	**37.96737**	**-121.46434**
4	Represented	Bacon Island Pump @ Old River	Mandeville Island-Connection Slough	544BIPAOR	37.97916	-121.57023
4	Represented	East Orwood Tract Drain	Jersey Island-Taylor Slough	544EOWDTD	37.92857	-121.56067
4	Represented	Kellogg Creek along Hoffman Ln	Lower Kellogg Creek	544XKCAHL	37.88188	-121.65221
4	Represented	South McDonald Island Pump	Fivemile Creek-San Joaquin River	544SMCDIP	37.98928	-121.46285
5	**Core**	**Walthall Slough @ Woodward Ave[2]**	**Walthall Slough-San Joaquin River**	**544WSAWAV**	**37.77046**	**-121.29227**
6	NA	Sand Creek @ Hwy 4 Bypass[3]		544SCAHFB	37.94750	-121.74300
7	**Core**	**Upper Roberts Island Drain**	**Roberts Island-Trapper Slough**	**544UPRRID**	**37.81893**	**-121.35830**
7	Represented	Union Island Drain @ Bonetti Rd	Union Island/Town of French Camp-San Joaquin River	544UIDABR	37.87170	-121.52551

[1] No monitoring will occur at Mokelumne River Drain @ North Lower Sacramento Rd. The Zone 1 Core site will represent water quality in the Murphy Creek – Mokelumne River HUC.
[2] Walthall Slough @ Woodward Ave is a Core site that will represent water quality in the Walthall Slough-San Joaquin River HUC.
[3] Sand Creek @ Hwy 4 Bypass is neither a Core or Represented site. The Zone 4 Core site also represents water quality in Zone 6.

Monitoring at Represented sites was determined based on the following criteria:

- Represented site is in a management plan for a pesticide, metal, or toxicity
- Exceedance of a pesticide, metal, or toxicity occurred at the Core site
- Core site is in a management plan for a pesticide, metal, or toxicity and monitoring is necessary at the Represented site to characterize potential discharge

The Coalition conducts two types of monitoring at Represented sites: monitoring based on management plans and monitoring based on exceedances of the WQTLs at the respective Core site. The Coalition conducts MPM as part of its management plan strategy to identify contaminant sources and evaluate the efficacy of outreach and newly implemented management practices. The Coalition monitors at a Represented site for a minimum of two years during the periods when there is the greatest potential (based on pesticide use data) to detect the constituent of concern in the waterbody.

The Coalition reviewed past exceedances and PUR data for the Core site in each zone and followed the strategy outlined in Figure 5 to determine which constituents to monitor at the Represented sites in each zone.

In the 2019 WY, the first year of monitoring after rotating Core sites, the Coalition will evaluate each Represented site for:

1) Constituents that were monitored at the old Core site during the 2017 and 2018 WYs and resulted in exceedances of WQTLs
2) Constituents in management plans at the new Core sites
3) A third year of Represented site monitoring if an exceedance occurred at the Represented site during the 2017 and/or 2018 WYs

If water column toxicity occurs at the Core site, the Coalition uses TIEs, if possible, to identify the pesticides potentially associated with toxicity. The Coalition conducts TIEs when toxicity to *Ceriodaphnia dubia* and *Pimephales promelas* result in 50% or less survival compared to the control and when toxicity to *Selenastrum capricornutum* results in 50% or less growth compared to the control. Appendix I includes a list of active ingredients, arranged by chemical group (herbicides, insecticides, metals, pyrethroids), that are associated with toxicity to *C. dubia*, *P. promelas*, and *S. capricornutum*. If the Coalition cannot associate applications of pesticides directly to toxicity, then the Coalition analyzes PUR data to identify application periods for the groups of chemicals associated with the specific toxicity (PUR data analyzed from 2015 through 2017 for this report).

If sediment toxicity to *Hyalella azteca* occurred at a Core site, the Coalition will monitor for sediment toxicity once during the storm season (March 1 through April 30) and once during the irrigation season (August 15 through October 15) at each Represented site in the Core site zone.

Each site subwatershed section below includes: 1) analysis and discussion of MPM for pesticides or toxicity, and 2) analysis and discussion of Represented site monitoring constituents based on past Core site exceedances and/or toxicity. Each of the two sections includes justification for the monitoring frequency.

Figure 5. SJCDWQC Represented site monitoring strategy flowchart.

ZONE 1 – MOKELUMNE RIVER @ BRUELLA RD

Mokelumne River @ Bruella Rd is rotating to Core site status in Zone 1 for the 2019 WY. In the 2019 WY, the Coalition will monitor monthly for Core site constituents at Mokelumne River @ Bruella Rd, including pesticides and toxicity according to the schedule developed from the PEP analyses.

Mokelumne River @ Bruella Rd is in a management plan for pH, *E. coli*, and water column toxicity to *S. capricornutum*. The Coalition does not conduct MPM for field parameters (pH) or *E. coli*; however, monitoring for those constituents occurs on every sampling event as part of the Core site monitoring strategy. Monitoring for water column toxicity to *S. capricornutum* will occur as MPM during months of past toxicity and as NM based on the PEP results.

Table 19 includes the status of active management plans and 2018 WY exceedances for all sites within Zone 2. During the 2018 WY, there were no exceedances of any WQTL or toxicity in any sample collected from the Core site.

Table 19. Zone 1 management plan constituents (M) at Core and Represented sites.
Core site information is bolded. Monitoring data through May 2018.

SITE NAME	DO	PH	SC	*E. COLI*	*S. CAPRICORNUTUM*
Bear Creek @ North Alpine Rd	M			M	
Coyote Creek Tributary @ Jack Tone Rd	M	M			
Jahant Slough @ Cherokee Ln	M		M		
Mokelumne River @ Bruella Rd		**M**		**M**	**M**
Mosher Creek @ North Alpine Rd	M				
Pixley Slough @ Furry Rd	M				

Bear Creek @ North Alpine Rd

Bear Creek @ North Alpine Rd is one of the two rotating Core sites in Zone 1; in the 2019 WY, the site is rotating to Represented site status. During the 2018 WY, the Coalition conducted NM for Core site constituents; there were exceedances of the WQTL for DO and *E. coli*. The Bear Creek @ North Alpine Rd site subwatershed is in a management plan for DO and *E. coli* (Table 19).

2019 WY Monitoring

The Coalition does not conduct MPM for field parameters (DO) or *E. coli*. In the 2019 WY, the Coalition will not monitor at Bear Creek @ North Alpine Rd.

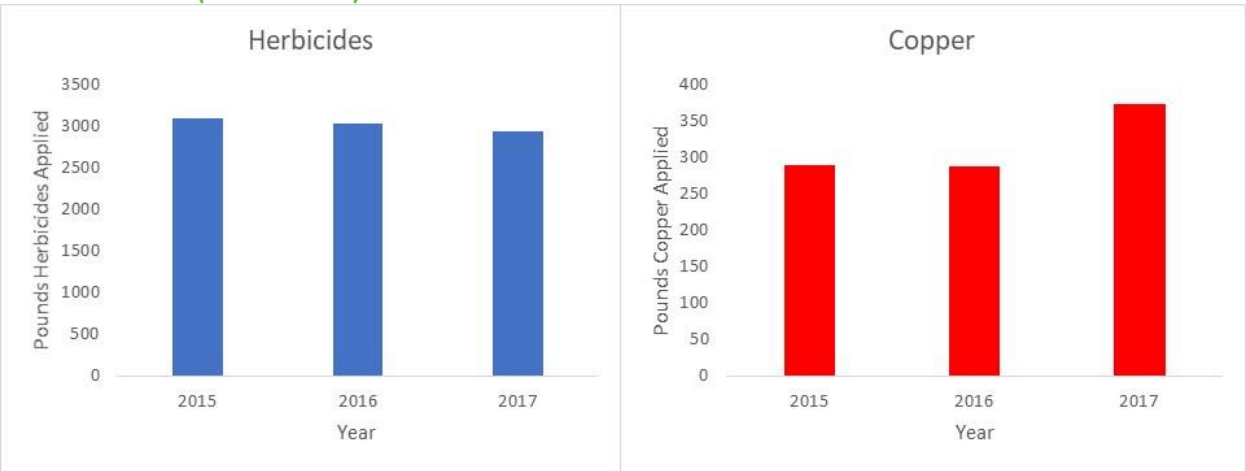
Water column toxicity to *S. capricornutum*

The Coalition assessed the potential for monitoring for water column toxicity to *S. capricornutum* at Bear Creek @ North Alpine Rd based on the management plan at the Core site. From October 2008 through May 2018, the Coalition monitored 47 times for water column toxicity to *S.*

capricornutum at Bear Creek @ North Alpine Rd; no toxicity occurred. The PUR data indicate 12,852 lbs of herbicides were applied in the past three years; there was little fluctuation in herbicide and copper applications (Figure 6).

There is a low risk of water column toxicity to *S. capricornutum*, as indicated by sufficient monitoring history with no toxicity and no increase in the pounds of herbicide applied. Therefore, during the 2019 WY, the Coalition will not monitor for water column toxicity to *S. capricornutum* at Bear Creek @ North Alpine Rd.

Figure 6. Herbicide and copper applications in the Bear Creek @ North Alpine Rd site subwatershed (2015-2017).



Coyote Creek Tributary @ Jack Tone Rd

Coyote Creek Tributary @ Jack Tone Rd is a Represented site in Zone 1. The Coalition did not monitor at this site in the 2018 WY since all Represented site monitoring requirements were completed. The Coyote Creek Tributary @ Jack Tone Rd site subwatershed is in a management plan for DO and pH (Table 19).

2019 WY Monitoring

The Coalition does not conduct MPM for field parameters (DO and pH). In the 2019 WY, the Coalition will not monitor at Coyote Creek Tributary @ Jack Tone Rd.

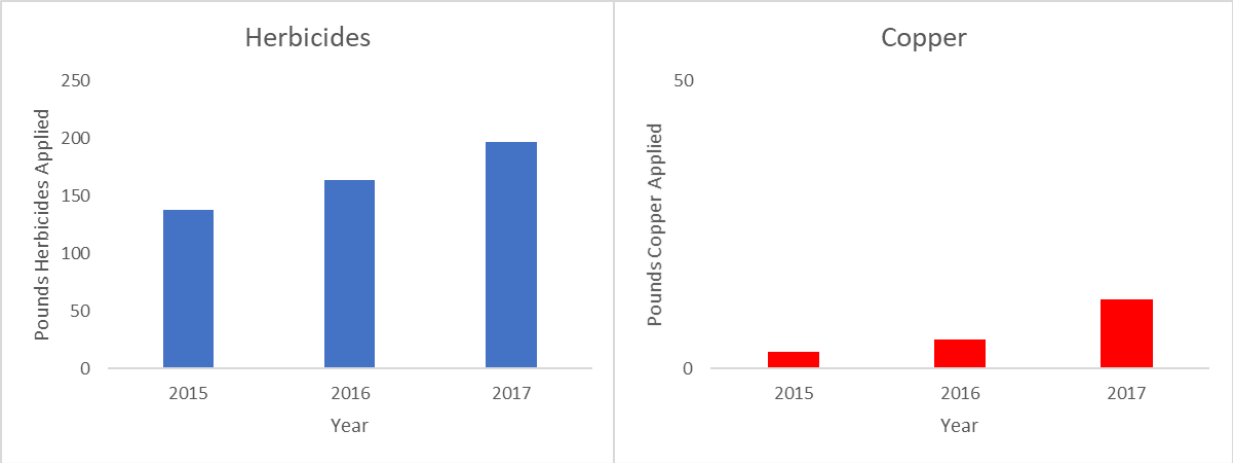
Water column toxicity to *S. capricornutum*

The Coalition assessed the potential for monitoring for water column toxicity to *S. capricornutum* at Coyote Creek Tributary @ Jack Tone Rd based on the management plan at the Core site. From December 2014 through June 2016, the Coalition monitored 11 times for water column toxicity to *S. capricornutum* at Coyote Creek Tributary @ Jack Tone Rd; no toxicity occurred. The PUR data from the past three years indicate low herbicide and copper applications (499 lbs and 20 lbs, respectively; Figure 7).

There is a low risk of water column toxicity to *S. capricornutum*, as indicated by sufficient monitoring history with no toxicity and low herbicide and copper applications. Therefore, during

the 2019 WY, the Coalition will not monitor for water column toxicity to *S. capricornutum* at Coyote Creek Tributary @ Jack Tone Rd.

Figure 7. Herbicide and copper applications in the Coyote Creek Tributary @ Jack Tone Rd site subwatershed (2015-2017).



Jahant Slough @ Cherokee Ln

Jahant Slough @ Cherokee Ln is a Represented site in Zone 1. The Coalition did not monitor at this site in the 2018 WY since all Represented monitoring requirements were complete. The Jahant Slough @ Cherokee Ln site subwatershed is currently in a management plan for DO and SC (Table 19).

2019 WY Monitoring

The Coalition does not conduct MPM for field parameters (DO and SC); however, monitoring for field parameters occurs on all sampling events. In the 2019 WY, the Coalition will conduct Represented site monitoring for water column toxicity to *S. capricornutum* at Jahant Slough @ Cherokee Ln.

Water Column Toxicity to *S. capricornutum*

The Coalition assessed the potential for monitoring for water column toxicity to *S. capricornutum* at Jahant Slough @ Cherokee Ln based on the management plan at the Core site. From January 2015 through July 2017, the Coalition monitored 13 times for water column toxicity to *S. capricornutum* at Jahant Slough @ Cherokee Ln; a single toxicity occurred in May of 2016. Due to the single toxicity, the Coalition monitored for an additional year during the 2017 WY; no toxicity occurred. The PUR data indicate 1,380 lbs of herbicides were applied in the past three years with an increase in herbicide applications in the site subwatershed in 2017; there were low copper applications with 62 total pounds applied in the past three years (Figure 8).

In the 2019 WY, the Coalition will monitor for water column toxicity to *S. capricornutum* during months of peak herbicide and copper applications in January through May (Figure 9).

Figure 8. Herbicide and copper applications in the past three years (2015-2017) in the Jahant Slough @ Cherokee Ln site subwatershed.

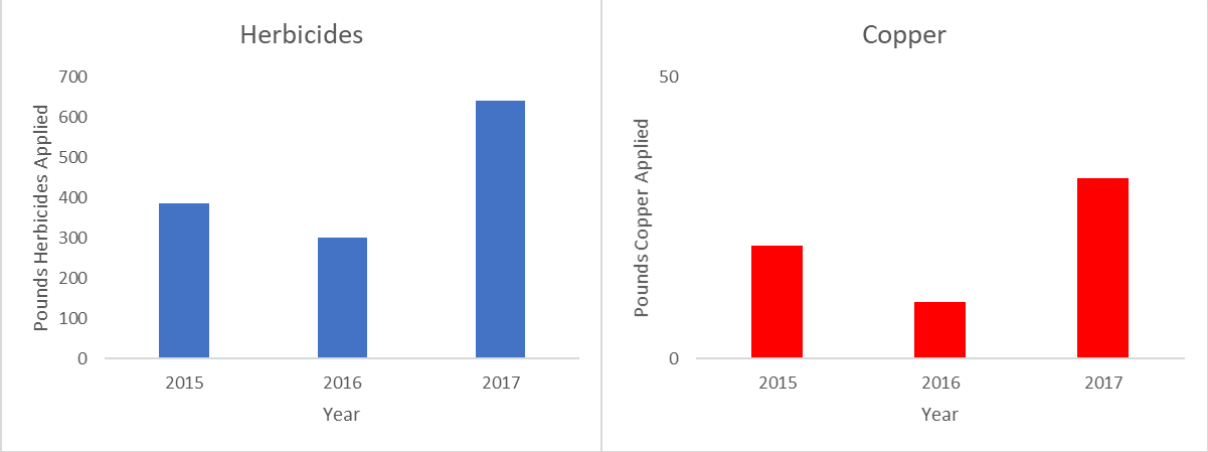
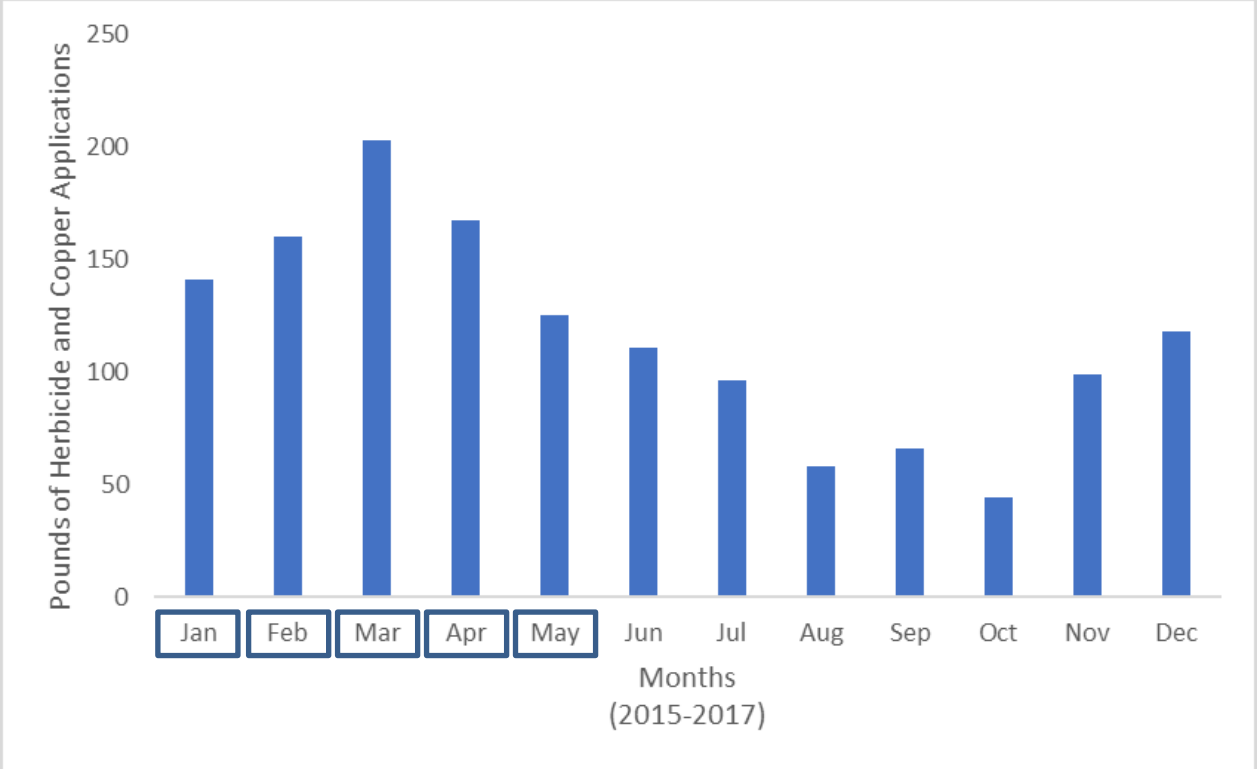


Figure 9. Monitoring selection based on herbicide and copper applications in the Jahant Slough @ Cherokee Ln site subwatershed.

Months selected for monitoring are boxed.



Mosher Creek @ North Alpine Rd

Mosher Creek @ North Alpine Rd is a Represented site in Zone 1. The Coalition did not monitor at this site in the 2018 WY since all Represented monitoring requirements were complete. The Mosher Creek @ North Alpine Rd site subwatershed is currently in a management plan for DO (Table 19).

2019 WY Monitoring

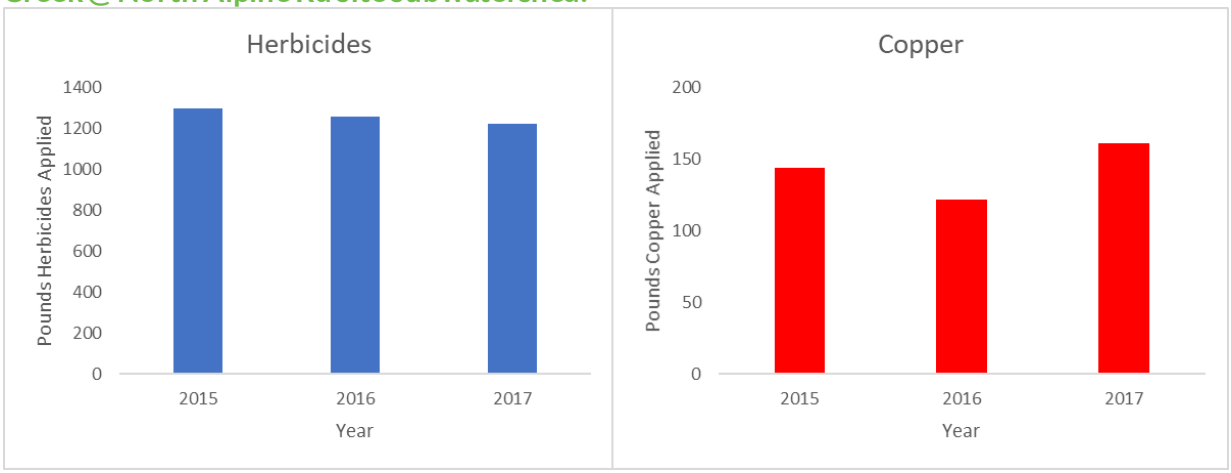
The Coalition does not conduct MPM for field parameters (DO). In the 2019 WY, the Coalition will not monitor at Mosher Creek @ North Alpine Rd.

Water Column Toxicity to *S. capricornutum*

The Coalition assessed the potential for monitoring for water column toxicity to *S. capricornutum* at Mosher Creek @ North Alpine Rd based on the management plan at the Core site. From April 2015 through June 2017, the Coalition monitored nine times for water column toxicity to *S. capricornutum* at Mosher Creek @ North Alpine Rd; a single toxicity occurred. Due to the single toxicity, the Coalition monitored for an additional year during the 2017 WY; no toxicity occurred. The PUR data indicate 3,767 lbs of herbicides were applied in the past three years; little variation in herbicide and copper applications occurred in the site subwatershed (Figure 10). The Coalition has sufficiently monitored Mosher Creek with only a single exceedance in three years; there has not been a change in herbicide or copper use since the last year of monitoring.

Therefore, during the 2019 WY, the Coalition will not monitor for water column toxicity to *S. capricornutum* at Mosher Creek @ North Alpine Rd.

Figure 10. Herbicide and copper applications in the past three years (2015 -2017) in the Mosher Creek @ North Alpine Rd site subwatershed.



Pixley Slough @ Furry Rd

Pixley Slough @ Furry Rd is a Represented site in Zone 1. The Coalition did not monitor at Pixley Slough @ Furry Rd in the 2018 WY since all Represented site monitoring requirements were completed. The Pixley Slough @ Furry Rd site subwatershed is in a management plan for DO (Table 19).

2019 WY Monitoring

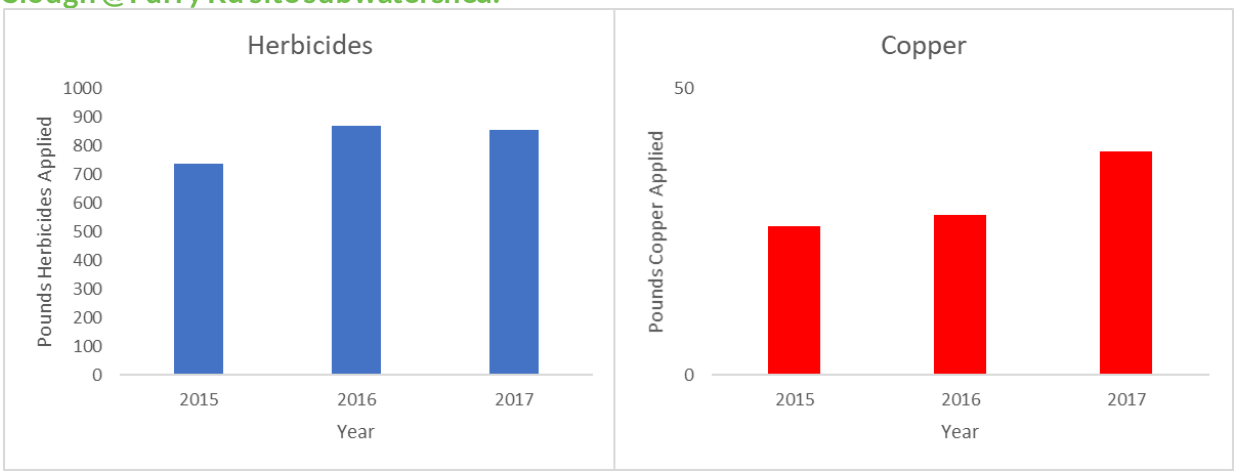
The Coalition does not conduct MPM for field parameters (DO). In the 2019 WY, the Coalition will not monitor at Pixley Slough @ Furry Rd.

Water Column Toxicity to *S. capricornutum*

The Coalition assessed the potential for monitoring for water column toxicity to *S. capricornutum* at Pixley Slough @ Furry Rd based on the management plan at the Core site. From November 2014 through March 2016, the Coalition monitored 10 times for water column toxicity to *S. capricornutum* at Pixley Slough @ Furry Rd; six events were dry and no toxicity occurred. The PUR data indicate little variation in herbicide and copper applications with a total of 2,459 lbs of herbicides applied in the past three years (Figure 11).

There is a low risk of water column toxicity to *S. capricornutum*, as indicated by monitoring history with no toxicity and a similar number of pounds of herbicides applied within the subwatershed since the last year of monitoring. Therefore, during the 2019 WY, the Coalition will not monitor for water column toxicity to *S. capricornutum* at Pixley Slough @ Furry Rd.

Figure 11. Herbicide and copper applications in the past three years (2015 -2017) in the Pixley Slough @ Furry Rd site subwatershed.



ZONE 2 – DUCK CREEK @ HWY 4

Duck Creek @ Hwy 4 is rotating to Core site status in Zone 2 for the 2019 WY. In the 2019 WY, the Coalition will monitor monthly for Core site constituents at Duck Creek @ Hwy 4, including pesticides and toxicity according to the schedule developed from the PEP analyses.

Duck Creek @ Hwy 4 is in a management plan for DO, SC, *E. coli*, and chlorpyrifos. The Coalition does not conduct MPM for field parameters (DO and SC) or *E. coli*; however, monitoring for those constituents occurs on every sampling event as part of the Core site monitoring strategy. Monitoring for chlorpyrifos will occur as MPM and as NM based on the PEP results.

Table 20 includes the status of active management plans and 2018 WY exceedances for all sites within Zone 2. During the 2018 WY, a single exceedance of the WQTL for DO occurred at the Core site.

Table 20. Zone 2 management plan constituents (M) at Core and Represented sites.
Core site information is bolded. Monitoring data through May 2018.

Site Name	DO	pH	SC	*E. coli*	Ammonia as N	Lead	Chlorpyrifos	Diuron
Duck Creek @ Hwy 4	**M**		**M**	**M**			**M**	
French Camp Slough @ Airport Way	M			M			M	M
Littlejohns Creek @ Jack Tone Rd	M	M		M				
Lone Tree Creek @ Jack Tone Rd	M			M	M			
Mormon Slough @ Jack Tone Rd	M	M					M	
Unnamed Drain to Lone Tree Creek @ Jack Tone Rd	M	M		M		M	M	

M – Indicates constituent is in a management plan at the site.

French Camp Slough @ Airport Way

French Camp Slough @ Airport Way is one of the two rotating Core sites in Zone 2; in the 2019 WY the site is rotating to Represented site status. During the 2018 WY, the Coalition conducted NM for Core site constituents; there were exceedances of the WQTLs for DO and *E. coli*. Additionally, the Coalition conducted MPM for chlorpyrifos and diuron; no exceedance occurred. The French Camp Slough @ Airport Way site subwatershed is currently in a management plan for DO, *E. coli*, chlorpyrifos, and diuron (Table 20).

2019 WY Monitoring

The Coalition does not conduct MPM for field parameters (DO) or *E. coli*; however, monitoring for field parameters occurs during every sampling event. In the 2019 WY, the Coalition will conduct MPM for chlorpyrifos and diuron at French Camp Slough @ Airport Way.

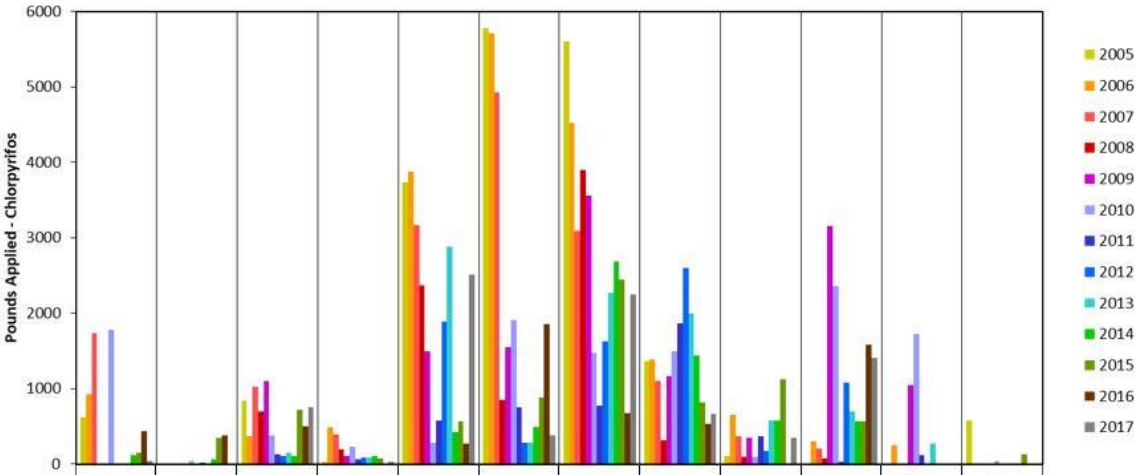
Chlorpyrifos

From February 2005 through May 2018, the Coalition monitored for chlorpyrifos 113 times at French Camp Slough @ Airport Way; there were 15 exceedances, with the most recent in March 2016. The PUR data indicate a general decline in chlorpyrifos use in the site subwatershed, but there were several months where use spiked in 2017; these months include March, May, and July through October. There was very little chlorpyrifos use in January, February, April, November, and December; these months accounted for 9% of the total use. Additionally, the Coalition monitored for chlorpyrifos during the months of low use for three or more years without exceedances (Figure 12). Although use in June accounted for 14% of total use in the past three years, monitoring during June has never resulted in an exceedance.

Therefore, during the 2019 WY, the Coalition will continue MPM for chlorpyrifos in March, and May, and July through October.

Figure 12. French Camp Slough @ Airport Way chlorpyrifos use and monitoring history.

Pesticide use data through 2017. Monitoring data through May 2018. Shaded cells represent scheduled months of past monitoring. "X" indicates months in which exceedances occurred. Striped cells indicate were scheduled monitoring has not yet occurred.



Monitoring Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2005							X	X				
2006		X					X					
2007		X										
2008					X			X	X			
2009										X		
2010								X				
2011				X						X		
2012												
2013							X					
2014												
2015	X											
2016			X									
2017												
2018											2019WY	
Total Use (2005-2017)	5,810	853	6,858	1,864	24,017	25,635	34,832	16,732	4,834	11,972	3,400	754
% Total (2005-2017)	*4%*	*1%*	*5%*	*1%*	*17%*	*19%*	*25%*	*12%*	*4%*	*9%*	*2%*	*1%*
Total Use (2015-2017)	624	724	1,975	99	3,346	3,111	5,355	2,006	1,474	3,539	0	124
% Total (2015-2017)	*3%*	*3%*	*9%*	*0%*	*15%*	*14%*	*24%*	*9%*	*7%*	*16%*	*0%*	*1%*

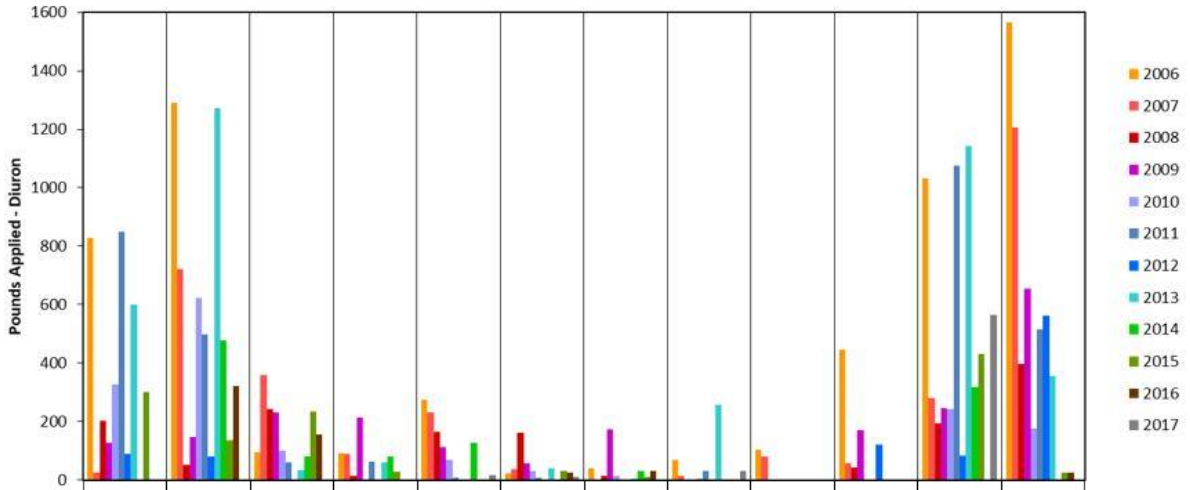
Diuron

From May 2006 through February 2018, the Coalition monitored for diuron 83 times at French Camp Slough @ Airport Way; there were four exceedances, with the most recent occurring in February 2015. The PUR data indicate that diuron use occurs primarily during the winter season, accounting for 92% of total use in the past three years (Figure 13). Due to an increase in use of diuron in November, the Coalition will add November and December to the MPM schedule. Although an exceedance occurred in January 2008, the Coalition has monitored for diuron in the month of January for seven years with no exceedances and will discontinue MPM for diuron during this month.

Therefore, in the 2019 WY, the Coalition will continue MPM for diuron in November, December, and February.

Figure 13. French Camp Slough @ Airport Way diuron and monitoring history.

Pesticide use data through 2017. Monitoring data through May 2018. Shaded cells represent scheduled months of past monitoring. "X" indicates months in which exceedances occurred. Striped cells indicate were scheduled monitoring has not yet occurred.



Monitoring Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2006												
2007		X										
2008	X											
2009												
2010												
2011												
2012												
2013												
2014		X										
2015		X										
2016												
2017												
2018											2019WY	
Total Use (2006-2017)	3,348	5,619	1,590	634	1,000	420	315	408	184	839	5,608	5,482
% Total (2006-2017)	*13%*	*22%*	*6%*	*2%*	*4%*	*2%*	*1%*	*2%*	*1%*	*3%*	*22%*	*22%*
Total Use (2015-2017)	301	457	389	26	17	66	41	31	0	0	998	48
% Total (2015-2017)	*13%*	*19%*	*16%*	*1%*	*1%*	*3%*	*2%*	*1%*	*0%*	*0%*	*42%*	*2%*

Littlejohns Creek @ Jack Tone Rd

Littlejohns Creek @ Jack Tone Rd is a Represented site in Zone 2. During the 2018 WY, the Coalition conducted Represented site monitoring for ammonia due to an exceedance at the previous Core site, French Camp Slough @ Airport Way in 2015; no exceedance occurred. The Littlejohns Creek @ Jack Tone Rd site subwatershed is currently in a management plan for DO, pH, and *E. coli* (Table 20).

2019 WY Monitoring

The Coalition does not conduct MPM for field parameters (DO and pH) or *E. coli*. In the 2019 WY, the Coalition will not monitor at Littlejohns Creek @ Jack Tone Rd.

Ammonia

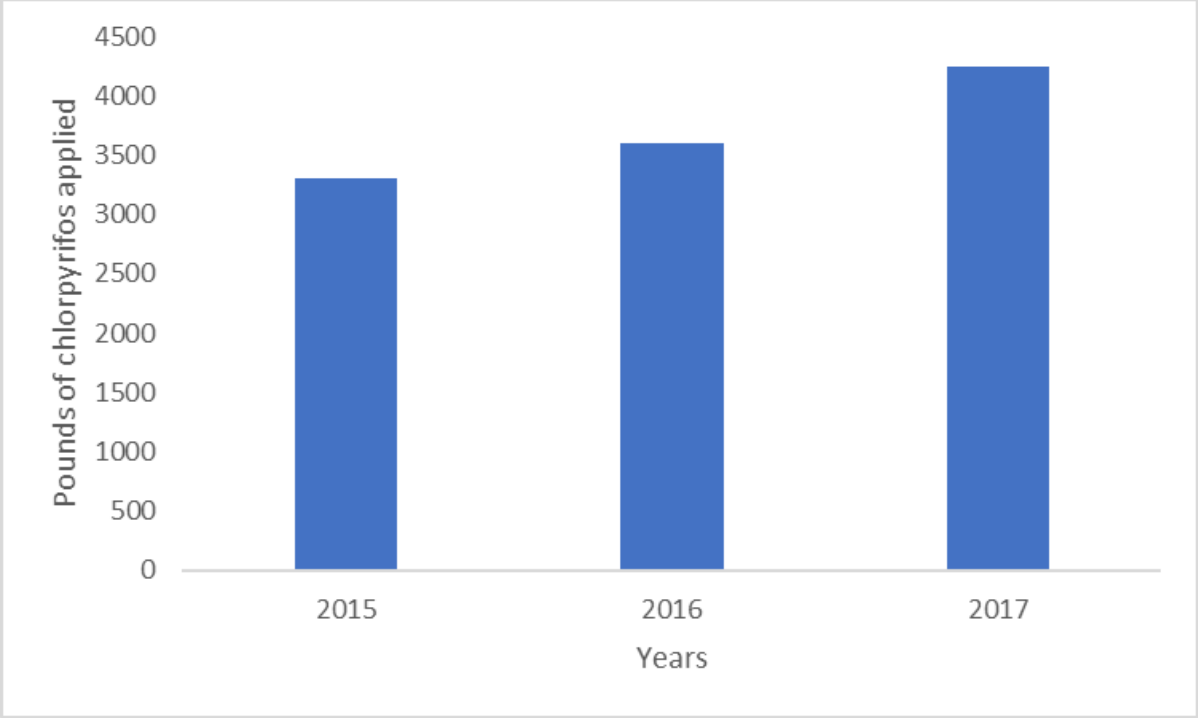
The Coalition conducted Represented site monitoring for ammonia at Littlejohns Creek @ Jack Tone Rd in March 2017 and 2018; there were no detections. According to the strategy outlined in Figure 5 for monitoring at Represented sites, the Coalition has completed Represented site monitoring requirements for ammonia. In the 2019 WY, the Coalition will not monitor for ammonia at Littlejohns Creek @ Jack Tone Rd.

Chlorpyrifos

The Coalition assessed the potential for need to monitor for chlorpyrifos at Littlejohns Creek @ Jack Tone Rd due to the Core site management plan. In 2015, the Coalition received approval to complete the management plan for chlorpyrifos in the Littlejohns Creek @ Jack Tone Rd site subwatershed. The PUR data indicate that use has not changed since the management plan was completed in 2015 (Figure 14).

There is a low risk of water quality impairment due to chlorpyrifos in the Littlejohns Creek @ Jack Tone Rd site subwatershed, as indicated by sufficient monitoring history with no exceedances and no increase in use. Therefore, during the 2019 WY, the Coalition will not monitor for chlorpyrifos at Littlejohns Creek @ Jack Tone Rd.

Figure 14. Chlorpyrifos applications in the past three years (2015-2017) in the Littlejohns Creek @ Jack Tone Rd site subwatershed.



Lone Tree Creek @ Jack Tone Rd

Lone Tree Creek @ Jack Tone Rd is a Represented site in Zone 2. In the 2018 WY, the Coalition conducted MPM for water column toxicity to *P. promelas*. Due to no toxicity as a result of management practices implemented by Coalition members, the Coalition received approval to complete the management plan for water column toxicity to *P. promelas* in February 2018. The Lone Tree Creek @ Jack Tone Rd site subwatershed is currently in a management plan for DO, *E. coli*, and ammonia (Table 20).

2019 WY Monitoring

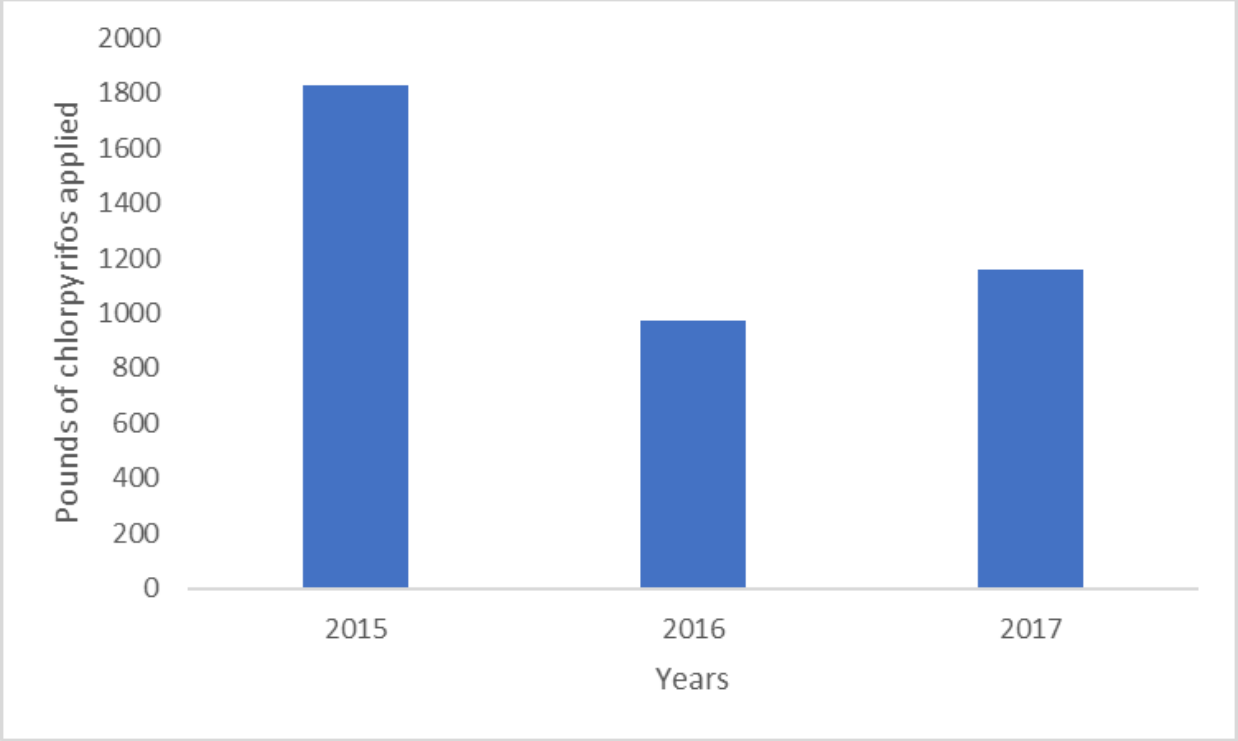
The Coalition does not conduct MPM for field parameters (DO), *E. coli*, or nutrients (ammonia). In the 2019 WY, the Coalition will not monitor at Lone Tree Creek @ Jack Tone Rd.

Chlorpyrifos

The Coalition assessed the potential for need to monitor for chlorpyrifos at Lone Tree Creek @ Jack Tone Rd due to the Core site management plan. On March 8, 2017, the Coalition received approval to complete the management plan for chlorpyrifos in the Lone Tree Creek @ Jack Tone Rd site subwatershed. Additionally, the PUR data indicate a total of 3,955 lbs of chlorpyrifos applied with no increase in use in the past three years.

There is a low risk of water quality impairment due to chlorpyrifos in the Lone Tree Creek @ Jack Tone Rd site subwatershed, as indicated by sufficient monitoring history with no exceedances and no increase in use. Therefore, during the 2019 WY, the Coalition will not monitor for chlorpyrifos at Lone Tree Creek @ Jack Tone Rd.

Figure 15. Chlorpyrifos applications in the past three years (2015-2017) in the Lone Tree Creek @ Jack Tone Rd site subwatershed.



Mormon Slough @ Jack Tone Rd

Mormon Slough @ Jack Tone Rd is a Represented site in Zone 2. In the 2018 WY, the Coalition conducted MPM for chlorpyrifos, and Represented site monitoring for ammonia due to an exceedance at the previous Core site, French Camp Slough @ Airport Way. There was a single exceedance of the WQTL for DO, which was monitored during every sampling event. The Mormon Slough @ Jack Tone Rd site subwatershed is currently in a management plan for DO, pH, and chlorpyrifos (Table 20).

2019 WY Monitoring

The Coalition does not conduct MPM for field parameters (DO and pH); however, monitoring for field parameters occurs on every sampling event. In the 2019 WY, the Coalition will conduct MPM for chlorpyrifos at Mormon Slough @ Jack Tone Rd.

Ammonia

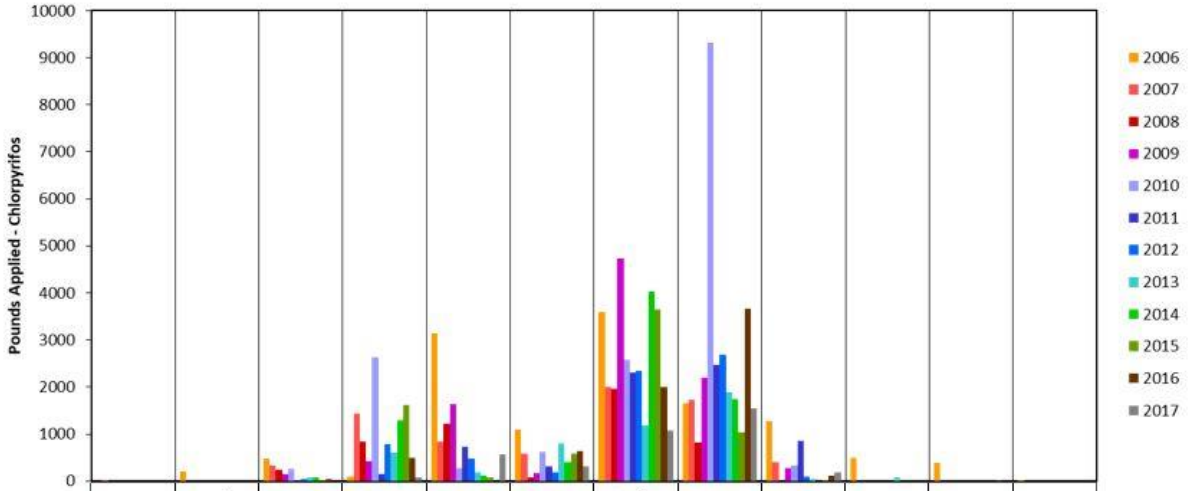
The Coalition conducted Represented site monitoring for ammonia at Mormon Slough @ Jack Tone Rd in March 2017 and 2018; there were no detections. According to the strategy outlined in Figure 5 for monitoring at Represented sites, the Coalition has completed Represented site monitoring requirements for ammonia. In the 2019 WY, the Coalition will not monitor for ammonia at Mormon Slough @ Jack Tone Rd.

Chlorpyrifos

From May 2006 through April 2018, the Coalition monitored for chlorpyrifos 52 times at Mormon Slough @ Jack Tone Rd; there were 10 exceedances, with the most recent in August 2016. The PUR data indicate chlorpyrifos is mainly applied during the irrigation season from April through August, accounting for 98% of total use in the past three years (Figure 16). Therefore, in the 2019 WY, the Coalition will continue MPM for chlorpyrifos from April through August.

Figure 16. Mormon Slough @ Jack Tone Rd chlorpyrifos use and monitoring history.

Pesticide use data through 2017. Monitoring data through May 2018. Shaded cells represent scheduled months of past monitoring. "X" indicates months in which exceedances occurred. Striped cells indicate were scheduled monitoring has not yet occurred.



Monitoring Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2006					X							
2007									X			
2008					X		X	X	X			
2009												
2010												
2011									X			
2012												
2013									NS			
2014												
2015							X					
2016								X				
2017												
2018											2019WY	
Total Use (2006-2017)	1	210	1,734	10,424	9,280	5,732	31,426	30,774	3,559	563	421	1
% Total (2006-2017)	*0%*	*0%*	*2%*	*11%*	*10%*	*6%*	*33%*	*33%*	*4%*	*1%*	*0%*	*0%*
Total Use (2015-2017)	0	0	74	2,181	649	1,532	6,713	6,254	318	0	28	0
% Total (2015-2017)	*0%*	*0%*	*0%*	*12%*	*4%*	*9%*	*38%*	*35%*	*2%*	*0%*	*0%*	*0%*

NS – Not sampled.

Unnamed Drain to Lone Tree Creek @ Jack Tone Rd

Unnamed Drain to Lone Tree Creek @ Jack Tone Rd is a Represented site in Zone 2. During the 2018 WY, the Coalition conducted MPM for chlorpyrifos and lead; no exceedance occurred. The Coalition also conducted Represented site monitoring for diuron, as well as ammonia due to an

exceedance at the previous Core site, French Camp Slough; no exceedances occurred. The Unnamed Drain to Lone Tree Creek @ Jack Tone Rd site subwatershed is in a management plan for DO, *E. coli*, lead, and chlorpyrifos (Table 20).

2019 WY Monitoring

The Coalition does not conduct MPM for field parameters (DO) or *E. coli*; however, monitoring for field parameters occurs on all sampling events. In the 2019 WY, the Coalition will conduct MPM for lead and chlorpyrifos, and Represented site monitoring for ammonia at Unnamed Drain to Lone Tree Creek @ Jack Tone Rd.

Ammonia

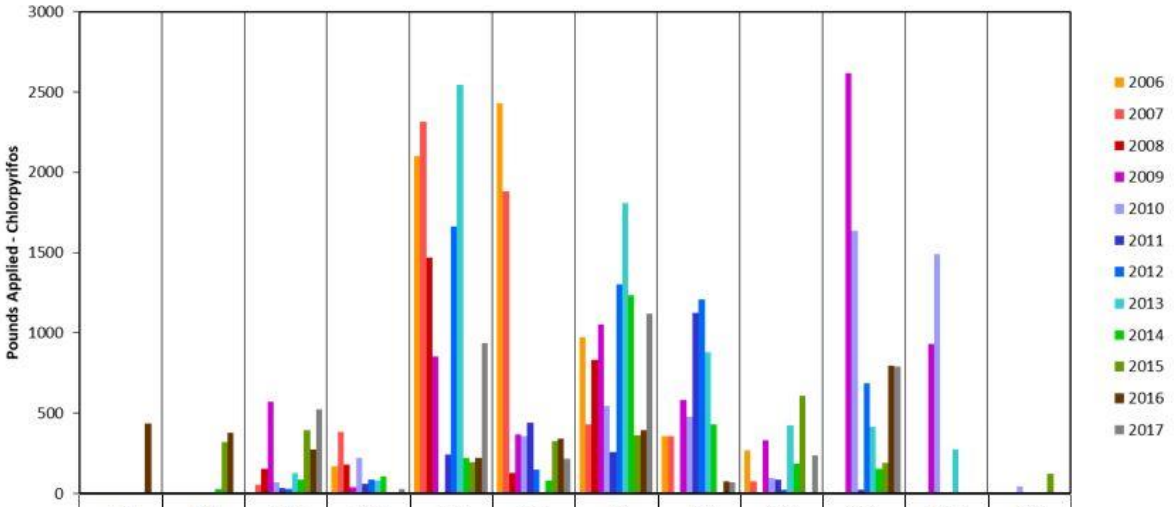
The Coalition conducted Represented site monitoring for ammonia at Unnamed Drain to Lone Tree Creek @ Jack Tone Rd in March 2017 and 2018; there was a single exceedance in March 2017. According to the strategy outlined in Figure 5 for monitoring at Represented sites, the Coalition is required to monitor for ammonia for a third consecutive year. In the 2019 WY, the Coalition will monitor for ammonia in March 2019.

Chlorpyrifos

From June 2006 through May 2018, the Coalition monitored 97 times for chlorpyrifos at Unnamed Drain to Lone Tree Creek @ Jack Tone Rd; there were 22 exceedances, with the most recent in June 2015. The PUR data indicate peak chlorpyrifos applications in the irrigation season, (Figure 17). The PUR indicate decline in use for the months of January, August, and September; in addition, the Coalition has monitored during the months of January, August, and September for three or more years with no exceedance. The Coalition will instead conduct MPM for chlorpyrifos during the months of March and October due to a spike in chlorpyrifos use in the past two years for those months. Therefore, in the 2019 WY, the Coalition will conduct MPM for chlorpyrifos in March, May through July, and October.

Figure 17. Unnamed Drain to Lone Tree Creek @ Jack Tone Rd chlorpyrifos use and monitoring history.

Pesticide use data through 2017. Monitoring data through May 2018. Shaded cells represent scheduled months of past monitoring. "X" indicates months in which exceedances occurred. Striped cells indicate where scheduled monitoring has not yet occurred.



Monitoring Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2006					NS		X		X			
2007		X					X		X			
2008	X				X	X	X		X			
2009					X		X		X			
2010								X			X	X
2011	X						X					NS
2012												X
2013		NS					X					
2014												
2015	X					X						NS
2016												
2017												
2018											2019WY	
Total Use (2006-2017)	437	725	2,319	1,353	12,751	6,735	10,315	5,566	2,336	7,306	2,696	168
% Total (2006-2017)	*1%*	*1%*	*4%*	*3%*	*24%*	*13%*	*20%*	*11%*	*4%*	*14%*	*5%*	*0%*
Total Use (2015-2017)	437	696	1,194	29	1,350	885	1,880	146	844	1,777	0	124
% Total (2015-2017)	*5%*	*7%*	*13%*	*0%*	*14%*	*9%*	*20%*	*2%*	*9%*	*19%*	*0%*	*1%*

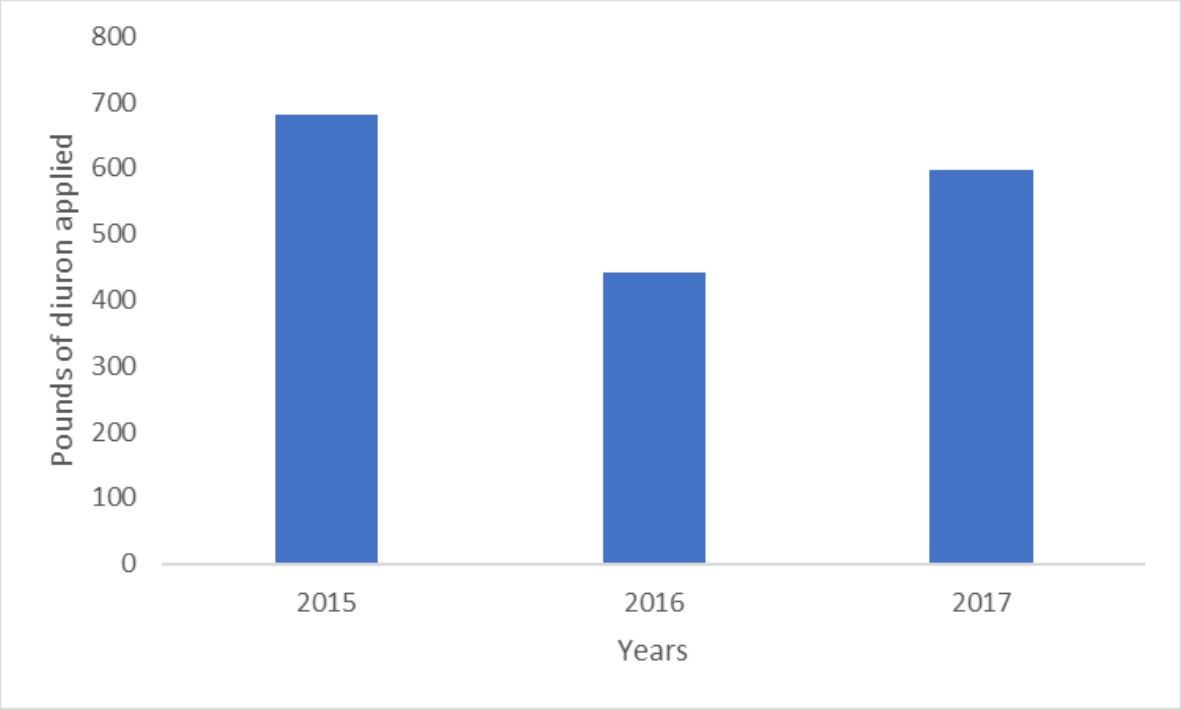
NS – Not sampled.

Diuron

On March 8, 2017, the Coalition received approval to complete the management plan for diuron in the Unnamed Drain to Lone Tree Creek @ Jack Tone Rd site subwatershed. However, in January 2017, there was an exceedance of the WQTL for diuron in samples collected at Unnamed Drain to Lone Tree Creek @ Jack Tone Rd. The Coalition monitored for diuron for an additional year at Unnamed Drain to Lone Tree Creek @ Jack Tone Rd in the 2018 WY as part Represented site monitoring; there were no detections. The PUR data indicate 1,717 lbs of diuron applied in the site subwatershed in the past three years; there was little variation in applications between the years (Figure 18).

There is a low risk of water quality impairment due to diuron applications in the Unnamed Drain to Lone Tree Creek @ Jack Tone Rd site subwatershed, as indicated by sufficient monitoring history and diuron use patterns. In the 2019 WY, the Coalition will not monitor for diuron in the Unnamed Drain to Lone Tree Creek @ Jack Tone Rd site subwatershed.

Figure 18. Diuron applications in the past three years (2015-2017) in the Unnamed Drain to Lone Tree Creek @ Jack Tone Rd site subwatershed.



Lead

The Coalition does not typically conduct MPM for lead. However, since only one additional year of monitoring without exceedances is required to complete the management plan for lead in the Unnamed Drain to Lone Tree Creek @ Jack Tone Rd site subwatershed, the Coalition will continue MPM for lead. During the 2018 WY, the Coalition conducted MPM for lead in April 2018; there were no detections. During the 2019 WY, the Coalition will conduct MPM for lead in April and September.

ZONE 3 – TERMINOUS TRACT DRAIN @ HWY 12

Terminous Tract Drain @ Hwy 12 is rotating to Core site status in Zone 3 in the 2019 WY. In the 2019 WY, the Coalition will monitor monthly for Core site constituents at Terminous Tract Drain @ Hwy 12, including pesticides and toxicity according to the schedule developed from the PEP analyses.

Terminous Tract Drain @ Hwy 12 is in a management plan for DO, SC, *E. coli*, ammonia, nitrate + nitrite, arsenic, chlorpyrifos, diuron, and water column toxicity to *S. capricornutum*. The Coalition does not conduct MPM for field parameters (DO and SC), *E. coli*, or nutrients (ammonia and nitrate + nitrite); however, monitoring for those constituents occurs on every sampling event in accordance with the Core site monitoring strategy. Monitoring for arsenic is addressed in the 'Core Site Metals' section and will not occur in the 2019 WY. Monitoring for chlorpyrifos, diuron, and water column toxicity to *S. capricornutum* will occur as MPM based pesticide use and past toxicity, and as NM based on the PEP results.

Table 21 includes the status of active management plans and 2018 WY exceedances for all sites within Zone 3. During the 2018 WY, there were exceedances of the WQTLs for DO and SC at the Core site.

Table 21. Zone 3 management plan constituents (M) at Core and Represented sites.
Core site information is bolded. Monitoring data through May 2018.

Site Name	DO	pH	SC	*E. coli*	Nitrate + Nitrite	Arsenic	Chlorpyrifos	Diuron	*S. capricornutum*
Drain @ Woodbridge	M		M	M		M			M
Empire Tract @ 8 Mile Rd	M		M	M		M			M
Rindge Tract Drain	M		M						M
Staten Island Drain @ Staten Island Rd	M	M	M		M				M
Terminous Tract Drain @ Hwy 12	**M**		**M**	**M**	**M**	**M**	**M**	**M**	**M**

M – Indicates constituent is in a management plan at the site.
M – Indicates exceedance in the 2018 WY triggered a management plan.

Drain @ Woodbridge Rd

Drain @ Woodbridge Rd is one of two rotating Core sites in Zone 3; in the 2019 WY, the site is rotating to Represented site status. During the 2018 WY, the Coalition conducted NM for Core site constituents; no MPM occurred. The Drain @ Woodbridge Rd site subwatershed is in a management plan for DO, SC, *E. coli*, and arsenic (Table 21). Due to toxicity in samples in the 2018 WY, the Coalition will initiate a management plan for water column toxicity to *S. capricornutum*.

2019 WY Monitoring

The Coalition does not conduct MPM for field parameters (DO and SC), *E. coli*, or metals not applied for agriculture (arsenic); however, monitoring for field parameters occurs on every

sampling event. In the 2019 WY, the Coalition will conduct MPM for water column toxicity to *S. capricornutum* in conjunction with focused outreach at Drain @ Woodbridge Rd.

Chlorpyrifos

The Coalition assessed the potential for need to monitor for chlorpyrifos at Drain @ Woodbridge Rd due to the Core site management plan. In December 2015, the Coalition received approval to complete the management plan for chlorpyrifos in the Drain @ Woodbridge Rd site subwatershed. The PUR data indicate no applications of chlorpyrifos in the past three years.

There is a low risk of water quality impairment due to chlorpyrifos in the Drain @ Woodbridge Rd site subwatershed, as indicated by sufficient monitoring history with no exceedances and a no use. Therefore, during the 2019 WY, the Coalition will not monitor for chlorpyrifos at Drain @ Woodbridge Rd.

Diuron

The Coalition assessed the potential for need to monitor for diuron at Drain @ Woodbridge Rd due to the Core site management plan. From October 2008 through September 2017, the Coalition monitored for diuron 31 times at Drain @ Woodbridge; no exceedances occurred. The PUR data indicate low use with a total of 22 lbs of diuron applied in the past three years.

There is low risk of water quality impairment due to diuron in the Drain @ Woodbridge Rd site subwatershed as indicated by sufficient monitoring history with no exceedances and low use. In the 2019 WY, the Coalition will not monitor for diuron at Drain @ Woodbridge Rd.

Water Column Toxicity to *S. capricornutum*

In the 2018 WY, the Coalition monitored for water column toxicity to *S. capricornutum* as part of NM; toxicity occurred three times in January and March, and June 2018. Therefore, the Coalition will initiate a management plan for water column toxicity to *S. capricornutum* in the Drain @ Woodbridge Rd site subwatershed. The Coalition will include Drain @ Woodbridge in the 2019 Focused Outreach round. The Coalition will initiate MPM for water column toxicity to *S. capricornutum* in conjunction with focused outreach during months of past toxicity: January, March, and June.

Empire Tract @ 8 Mile Rd

Empire Tract @ 8 Mile Rd is a Represented site in Zone 3. During the 2018 WY, the Coalition conducted Represented site monitoring for nitrate + nitrite due to an exceedance at the previous Core site, Terminous Tract Drain @ Hwy 12, and MPM for water column toxicity to *S. capricornutum*. The Empire Tract Drain @ 8 Mile Rd site subwatershed is in a management plan for DO, SC, *E. coli*, arsenic, and water column toxicity to *S. capricornutum* (Table 21).

2019 WY Monitoring

The Coalition does not conduct MPM for field parameters (DO and SC), E. coli, or metals not applied by agriculture (arsenic); however, monitoring for field parameters occurs on all sampling

events. In the 2019 WY, the Coalition will conduct MPM for water column toxicity to *S. capricornutum* at Empire Tract @ 8 Mile Rd.

Nitrate + Nitrite as N

The Coalition monitored for nitrate + nitrite during the 2017 and 2018 WYs; no exceedance occurred. As outlined in the Coalition's strategy for monitoring at a Represented site in Figure 5, the Coalition has completed Represented site monitoring requirements for nitrate + nitrite as N in this site subwatershed. In the 2019 WY, the Coalition will not monitor for nitrate + nitrite as N at Empire Tract @ 8 Mile Rd.

Chlorpyrifos

The Coalition assessed the potential for need to monitor for chlorpyrifos at Empire Tract @ 8 Mile Rd due to the Core site management plan. From July 2013 through September 2016, the Coalition monitored for chlorpyrifos 18 times at Empire Tract @ 8 Mile Rd; there were no detections. The PUR data from past three years indicate no applications of chlorpyrifos in the site subwatershed.

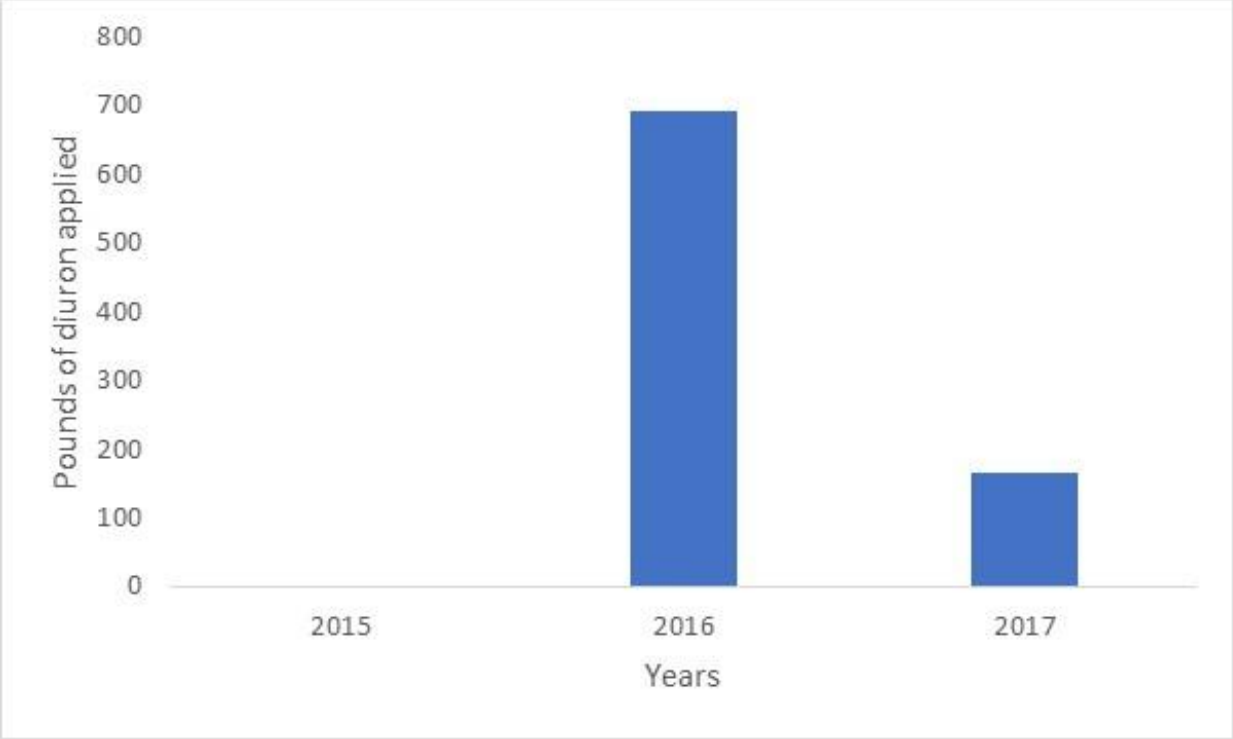
There is low risk of water quality impairment due to chlorpyrifos in the Empire Tract @ 8 Mile Rd site subwatershed as indicated by sufficient monitoring history with no detections and no use of the pesticide. In the 2019 WY, the Coalition will not monitor for chlorpyrifos at Empire Tract @ 8 Mile Rd.

Diuron

The Coalition assessed the potential for need to monitor for diuron at Empire Tract @ 8 Mile Rd due to the Core site management plan. From July 2013 through June 2014, the Coalition monitored for diuron 12 times at Empire Tract @ 8 Mile Rd; there were no detections. The PUR data from past three years indicate 855 lbs of diuron applied in the site subwatershed, with a decline in recent use (690 lbs in 2016 and 165 lbs in 2017; Figure 19).

There is low risk of water quality impairment due to diuron in the Empire Tract @ 8 Mile Rd site subwatershed as indicated by sufficient monitoring history with no detections and reduced use. In the 2019 WY, the Coalition will not monitor for diuron at Empire Tract @ 8 Mile Rd.

Figure 19. Diuron applications in the past three years (2015-2017) in the Empire Tract @ 8 Mile Rd site subwatershed.



Water Column Toxicity to *S. capricornutum*

A management plan for toxicity to *S. capricornutum* was initiated at Empire Tract @ 8 Mile Rd due to toxicity in samples collected in April 2014 and 2016. The Coalition included Empire Tract @ 8 Mile Rd in the 2018 Focused Outreach set, and concurrently initiated MPM for water column toxicity to *S. capricornutum*. In the 2019 WY, the Coalition will continue MPM for water column toxicity to *S. capricornutum* in April to assess the efficacy of outreach and new management practices.

Rindge Tract Drain

Rindge Tract Drain is a Represented site in Zone 3. During the 2018 WY, the Coalition conducted Represented site monitoring for nitrate + nitrite as N and water column toxicity to *S. capricornutum*. The Rindge Tract Drain site subwatershed is currently in a management plan for DO and SC (Table 21).

2019 WY Monitoring

The Coalition does not conduct MPM for field parameters (DO and SC); however, monitoring for field parameters occurs on all sampling events. In the 2019 WY, the Coalition will initiate MPM for water column toxicity to *S. capricornutum* in conjunction with focused outreach at Rindge Tract Drain. The Coalition will also conduct Represented site monitoring for chlorpyrifos due to an increase in use in the site subwatershed.

Nitrate + Nitrite as N

Due to an exceedance of the WQTL for nitrate + nitrite as N at the Core site (Terminous Tract Drain @ Hwy 12 in the 2015 WY) and no monitoring history at Rindge Tract Drain, the Coalition scheduled monitoring during the 2017 and 2018 WYs; no exceedance occurred. As outlined in the Coalition's strategy for monitoring at a Represented site in Figure 5 , the Coalition has completed Represented site monitoring requirements for nitrate + nitrite as N in this site subwatershed. In the 2019 WY, the Coalition will not monitor for nitrate + nitrite as N at Rindge Tract Drain.

Chlorpyrifos

The Coalition assessed the potential for need to monitor for chlorpyrifos at Rindge Tract Drain due to the Core site management plan. From March 2015 through September 2016, the Coalition monitored for chlorpyrifos eight times at Rindge Tract Drain; there were no detections. The PUR data indicate an increase of chlorpyrifos applications in 2017 (Figure 20). In the 2019 WY, the Coalition will monitor for chlorpyrifos at Rindge Tract Drain during months of peak use: February, August, and October (Figure 21).

Figure 20. Monitoring selection based on chlorpyrifos applications in the Rindge Tract Drain site subwatershed.

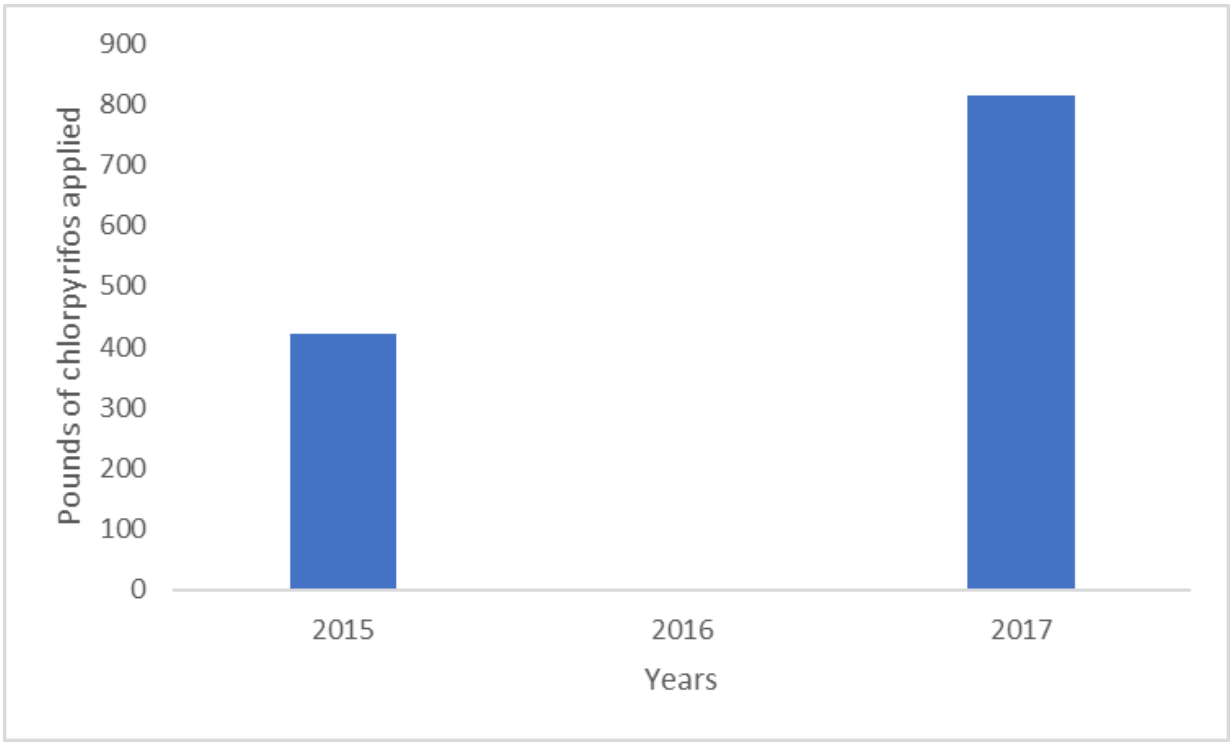
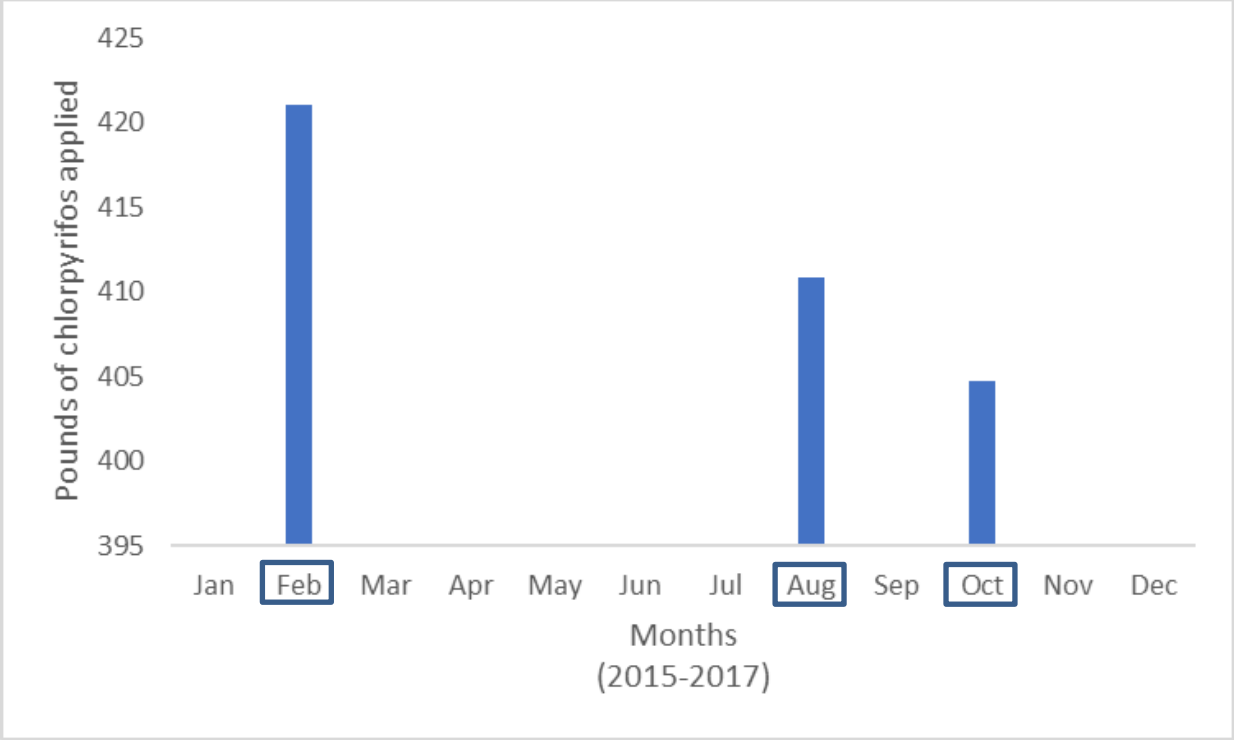


Figure 21. Monitoring selection based on chlorpyrifos applications in the Rindge Tract Drain site subwatershed.

Months selected for monitoring are boxed.



Diuron

The Coalition assessed the potential for need to monitor for diuron at Rindge Tract Drain due to the Core site management plan. The Coalition has not monitored for diuron at Rindge Tract Drain. However, the PUR data indicate low use with a single application of 16 lbs of diuron applied in the past three years.

There is low risk of water quality impairment due to diuron in the Rindge Tract Drain site subwatershed as indicated by low use. In the 2019 WY, the Coalition will not monitor for diuron at Rindge Tract Drain.

Water Column Toxicity to *S. capricornutum*

In the 2018 WY, the Coalition conducted a third consecutive year of Represented site monitoring for water column toxicity to *S. capricornutum* due to a toxic sample collected in April 2016; toxicity occurred in two samples collected in February and March 2018.

Due to toxicity in two samples in the 2018 WY, the Coalition will initiate a management plan, MPM, and focused outreach for water column toxicity to *S. capricornutum* in the Rindge Tract Drain site subwatershed in the 2019 WY. In the 2019 WY, the Coalition will conduct MPM for water column toxicity to *S. capricornutum* during February, March, and April.

Staten Island Drain @ Staten Island Rd

Staten Island Drain @ Staten Island Rd is a Represented site in Zone 2. In the 2018 WY, the Coalition monitored for nitrate + nitrite as N due to past exceedances at the previous Core site, Terminous Tract Drain @ Hwy 12. The Staten Island Drain @ Staten Island Rd is currently in a management plan for DO, pH, SC, and water column toxicity to *S. capricornutum* (Table 21). Due to an exceedance of the WQTL for nitrate + nitrite as N in the 2018 WY, the Coalition will initiate a management plan for nitrate + nitrite as N in the Staten Island Drain @ Staten Island Rd site subwatershed.

2019 WY Monitoring

The Coalition does not conduct MPM for field parameters (DO, pH, and SC) or nutrients (nitrate + nitrite as N); however, monitoring for field parameters occurs on all sampling events. In the 2019 WY, the Coalition will conduct MPM for water column toxicity to *S. capricornutum*.

Nitrate + Nitrite as N

Due to an exceedance of the WQTL for nitrate + nitrite as N at the Core site (Terminous Tract Drain @ Hwy 12 in the 2015 WY) and no monitoring history at Staten Island Drain @ Staten Island Rd, the Coalition scheduled monitoring during the 2017 and 2018 WYs; two exceedances occurred in January 2017 and 2018. Due to the exceedances, the Coalition will initiate a management plan for nitrate + nitrite as N in the Staten Island Drain @ Staten Island Rd site subwatershed. Monitoring will occur according the management plan strategy and is discussed in the section below.

Chlorpyrifos

The Coalition assessed the potential for need to monitor for chlorpyrifos at Staten Island Drain @ Staten Island Rd due to the Core site management plan. The Coalition has not monitored for chlorpyrifos at Staten Island Drain @ Staten Island Rd. However, the PUR data indicate no use in the site subwatershed.

There is low risk of water quality impairment due to chlorpyrifos in the Staten Island Drain @ Staten Island Rd site subwatershed as indicated by no use. In the 2019 WY, the Coalition will not monitor for chlorpyrifos at Staten Island Drain @ Staten Island Rd.

Diuron

The Coalition assessed the potential for need to monitor for diuron at Staten Island Drain @ Staten Island Rd due to the Core site management plan. The Coalition has not monitored for diuron at Staten Island Drain @ Staten Island Rd. However, the PUR data indicate no use in the site subwatershed.

There is low risk of water quality impairment due to diuron in the Staten Island Drain @ Staten Island Rd site subwatershed as indicated by no use. In the 2019 WY, the Coalition will not monitor for diuron at Staten Island Drain @ Staten Island Rd.

Water Column Toxicity to *S. capricornutum*

A management plan for toxicity to *S. capricornutum* was initiated in the Staten Island Drain @ Staten Island Rd site subwatershed due to toxicity that occurred in April 2016 and May 2017. The Coalition will initiate MPM for water column toxicity to *S. capricornutum* since focused outreach for Staten Island Drain @ Staten Island Rd was initiated in 2018. In the 2019 WY, the Coalition will conduct MPM for water column toxicity to *S. capricornutum* during April and May.

ZONE 4 – ROBERTS ISLAND @ WHISKEY SLOUGH PUMP

Roberts Island @ Whiskey Slough Pump is rotating to Core site status in Zone 4 for the 2019 WY. In the 2019 WY, the Coalition will monitor monthly for Core site constituents at Roberts Island @ Whiskey Slough Pump, including pesticides and toxicity according to the schedule developed from the PEP analyses.

Roberts Island @ Whiskey Slough Pump is in a management plan for DO, pH, SC, *E. coli*, DDE, and water column toxicity to *S. capricornutum*. The Coalition does not conduct MPM for field parameters (DO, pH, and SC), *E. coli*, or legacy pesticides (DDE). Monitoring for DO, SC, pH, and *E. coli* will occur during every sampling event in accordance with the Core site monitoring strategy. Monitoring for water column toxicity to *S. capricornutum* will occur as MPM during months of past toxicity and as NM based on the PEP results.

Table 22 includes the status of active management plans and 2018 WY exceedances for all sites within Zone 4. During the 2018 WY, there were exceedances of the WQTLs for DO, SC, *E. coli*, and water column toxicity to *S. capricornutum* at the Core site.

Table 22. Zone 4 management plan constituents (M) at Core and Represented sites.
Core site information is bolded. Monitoring data through May 2018.

Site Name	DO	pH	SC	*E. coli*	Arsenic	Ammonia	DDE	DDT	*S. capricornutum*
Bacon Island Pump @ Old River	M	M	M	M	M	M			M
East Orwood Tract Drain	M	M	M						M
Kellogg Creek along Hoffman Ln		M		M			M	M	
Roberts Island @ Whiskey Slough Pump	**M**	**M**	**M**	**M**			**M**		**M**
South McDonald Island Pump	M		M						M

M – Indicates constituent is in a management plan at the site.

Bacon Island Pump @ Old River

Bacon Island Pump @ Old River is one of the rotating Core sites in Zone 4; in the 2019 WY the site is rotating to Represented site status. During the 2018 WY, the Coalition conducted NM for Core site constituents; no MPM occurred. The Bacon Island Pump @ Old River site subwatershed is in a management plan for DO, pH, SC, *E. coli*, arsenic, and water column toxicity to *S. capricornutum*

(Table 22). Due to exceedances of the WQTL for ammonia in the 2018 WY, the Coalition will initiate a management plan for ammonia in the Bacon Island Pump @ Old River site subwatershed.

2019 WY Monitoring

The Coalition does not conduct MPM for field parameters (DO, pH, and SC), *E. coli*, metals not applied by agriculture (arsenic), or nutrients (ammonia); however, monitoring occurs for field parameters on every sampling event. In the 2019 WY, the Coalition will initiate MPM for water column toxicity to *S. capricornutum* in conjunction with focused outreach at Bacon Island Pump @ Old River.

Water column toxicity to *S. capricornutum*

A management plan for toxicity to *S. capricornutum* was initiated in the Bacon Island Pump @ Old River site subwatershed due to toxicity that occurred in February 2015, September 2017, and December 2017. The Coalition will initiate MPM for water column toxicity to *S. capricornutum* in conjunction with focused outreach in 2019. In the 2019 WY, the Coalition will conduct MPM for water column toxicity to *S. capricornutum* during February, September, and December.

East Orwood Tract Drain

East Orwood Tract Drain is a Represented site in Zone 4. In the 2018 WY, the Coalition conducted MPM for water column toxicity to *S. capricornutum* at East Orwood Tract Drain; toxicity occurred in two samples collected in February 2018 and April 2018. The East Orwood Tract Drain site subwatershed is currently in a management plan for DO, SC, and water column toxicity to *S. capricornutum* (Table 22).

2019 WY Monitoring

The Coalition does not conduct MPM for field parameters (DO and SC); however, monitoring for field parameters occurs on all sampling events. In the 2019 WY, the Coalition will conduct MPM for water column toxicity to *S. capricornutum* at East Orwood Tract Drain.

Water Column Toxicity to *S. capricornutum*

During the 2018 WY, MPM resulted in toxicity in two samples collected in February and April. The Coalition included East Orwood Tract Drain in the 2018 Focused Outreach set. In the 2019 WY, the Coalition will continue MPM for water column toxicity to *S. capricornutum* during February, May, and April in order to assess efficacy of outreach and new management practices.

Kellogg Creek along Hoffman Ln

Kellogg Creek along Hoffman Ln is a Represented site in Zone 4. The Coalition did not monitor at this site in the 2018 WY since all Represented site monitoring requirements were completed. Kellogg Creek along Hoffman Ln is in a management plan for pH, *E. coli*, DDE, and DDT (Table 22).

2019 WY Monitoring

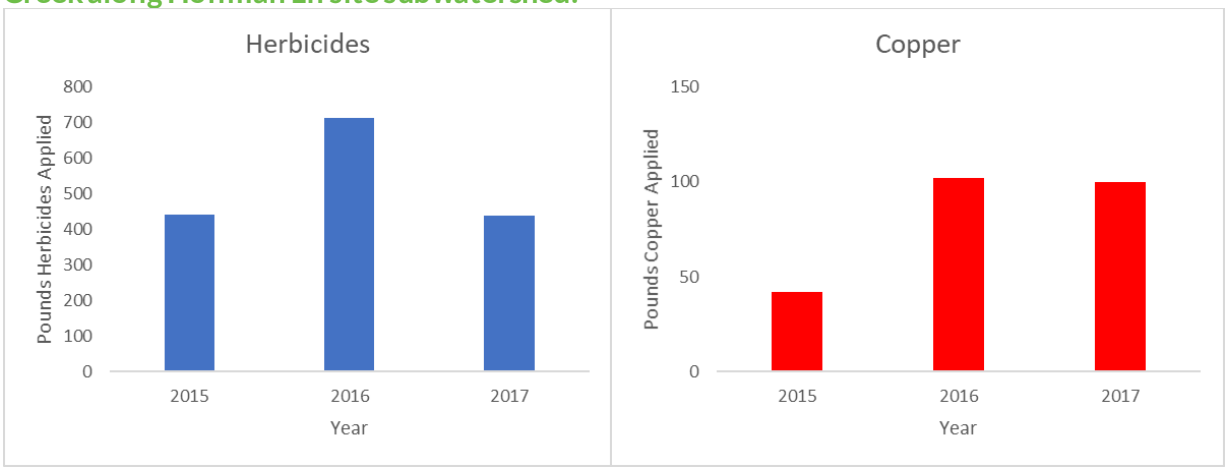
The Coalition does not conduct MPM for field parameters (pH), *E. coli*, or legacy pesticides (DDE and DDT). In the 2019 WY, the Coalition will not monitor at Kellogg Creek along Hoffman Ln.

Water Column Toxicity to *S. capricornutum*

The Coalition assessed the potential need for monitoring for water column toxicity to *S. capricornutum* at Kellogg Creek along Hoffman Ln based on the management plan at the Core site. In August 2014, the Coalition received approval to complete the Kellogg Creek along Hoffman Ln management plan for water column toxicity to *S. capricornutum*. The PUR data indicate a decrease in herbicide and no change in copper applications in 2017 (Figure 22).

There is a low risk of water column toxicity to *S. capricornutum*, as indicated by sufficient monitoring history with no toxicity and a decline in herbicide applications. Therefore, during the 2019 WY, the Coalition will not monitor for water column toxicity to *S. capricornutum* at Kellogg Creek along Hoffman Ln.

Figure 22. Herbicide and copper applications in the past three years (2015-2017) in the Kellogg Creek along Hoffman Ln site subwatershed.



South McDonald Island Pump

South McDonald Island Pump is a Represented site in Zone 4. In the 2018 WY, the Coalition conducted MPM for water column toxicity to *S. capricornutum* at South McDonald Island Pump; toxicity did not occur in any of the samples. The South McDonald Island Pump site subwatershed is in a management plan for DO, SC, and water column toxicity to *S. capricornutum* (Table 22).

2019 WY Monitoring

The Coalition does not conduct MPM for field parameters (DO and SC); however, monitoring for field parameters occurs during all sampling events. In the 2019 WY, the Coalition will conduct MPM for water column toxicity to *S. capricornutum* at South McDonald Island Pump.

Water Column Toxicity to *S. capricornutum*

The South McDonald Island Pump site subwatershed is in a management plan for water column toxicity to *S. capricornutum*. The Coalition will include South McDonald Island Pump in the 2019 Focused Outreach set. In the 2019 WY, the Coalition will continue MPM for water column toxicity to *S. capricornutum* during February and March.

ZONE 5 – WALTHALL SLOUGH @ WOODWARD AVE ZONE

Walthall Slough @ Woodward Ave is the Core site in Zone 5. In the 2019 WY, the Coalition will monitor monthly for Core site constituents at Walthall Slough @ Woodward Ave, including pesticides according to the schedule developed from the PEP analyses. The site is in a management plan for DO, SC, *E. coli*, nitrate, and water column toxicity to *S. capricornutum*. The Coalition does not conduct MPM for field parameters (DO and SC), *E. coli*, or nutrients (nitrate); however, monitoring for those constituents will occur monthly in accordance with the Core site monitoring strategy. Monitoring for water column toxicity to *S. capricornutum* will occur as MPM during months of past toxicity and as NM based on the PEP results.

There are no represented sites in Zone 5; the Walthall Slough @ Woodward Ave site subwatershed will represent water quality for the entire zone.

ZONE 6 – ROBERTS ISLAND @ WHISKEY SLOUGH PUMP

As discussed above, monitoring results from samples collected at the Zone 4 Core site will represent irrigated agricultural discharges in Zone 6.

Sand Creek @ Hwy 4 Bypass

Sand Creek @ Hwy 4 Bypass is the only monitoring site in Zone 6; it is neither a Core site nor a Represented site and is only monitored for management plan constituents. There is very little irrigated agriculture (402 irrigated acres) in the site subwatershed. Furthermore, this acreage receives drainage from recent urban developments, industrial sites, a golf course, field crops, grains, and pastureland.

2019 WY Monitoring

In 2017, the Coalition received approval to complete the Sand Creek @ Hwy 4 Bypass management plan for sediment toxicity to *H. azteca*. The remaining management plans at this site include field parameters (DO and SC), *E. coli*, and legacy pesticides (DDE and DDT); the Coalition does not conduct MPM for these constituents. In the 2019 WY, the Coalition will not monitor at Sand Creek @ Hwy 4 Bypass.

ZONE 7 – UPPER ROBERTS ISLAND DRAIN

Upper Roberts Island Drain is rotating to Core site status in Zone 7 for the 2019 WY In the 2019 WY, the Coalition will monitor monthly for Core site constituents at Upper Roberts Island Drain, including pesticides and toxicity according to the schedule developed from the PEP analyses.

Upper Roberts Island Drain is in a management plan for DO, SC, and water column toxicity to *C. dubia* and *S. capricornutum*. The Coalition does not conduct MPM for field parameters (DO and SC); however, monitoring for those constituents occurs on every sampling event in accordance with the Core site monitoring strategy. Monitoring for water column toxicity to *C. dubia* and *S. capricornutum* will occur as MPM during months of past toxicity and as NM based on the PEP results.

Table 23 includes the status of active management plans and 2018 WY exceedances for all sites within Zone 7. During the 2018 WY, there were exceedances of the WQTLs for DO and SC.

Table 23. Zone 7 management plan constituents (M) at Core and Represented sites.
Core site information is bolded. Monitoring data through May 2018.

SITE NAME	DO	SC	*E. COLI*	ARSENIC	CHLORPYRIFOS	DDE	*C. DUBIA*	*S. CAPRICORNUTUM*	*H. AZTECA*
Union Island Drain @ Bonetti Rd	M	M	M	M	M	M		M	M
Upper Roberts Island Drain	**M**	**M**					**M**	**M**	

M – Indicates constituent is in a management plan at the site.

Union Island Drain @ Bonetti Rd

Union Island Drain @ Bonetti Rd is one of the rotating Core sites in Zone 7; in the 2019 WY the site is rotating to Represented site status. During the 2018 WY, the Coalition conducted NM for Core site constituents and MPM for chlorpyrifos, water column toxicity to *C. dubia* and *S. capricornutum*, and sediment toxicity to *H. azteca*. Union Island Drain @ Bonetti Rd is in a management plan for DO, SC, *E. coli*, arsenic, chlorpyrifos, DDE, water column toxicity to *S. capricornutum*, and sediment toxicity to *H. azteca* (Table 23).

2019 WY Monitoring

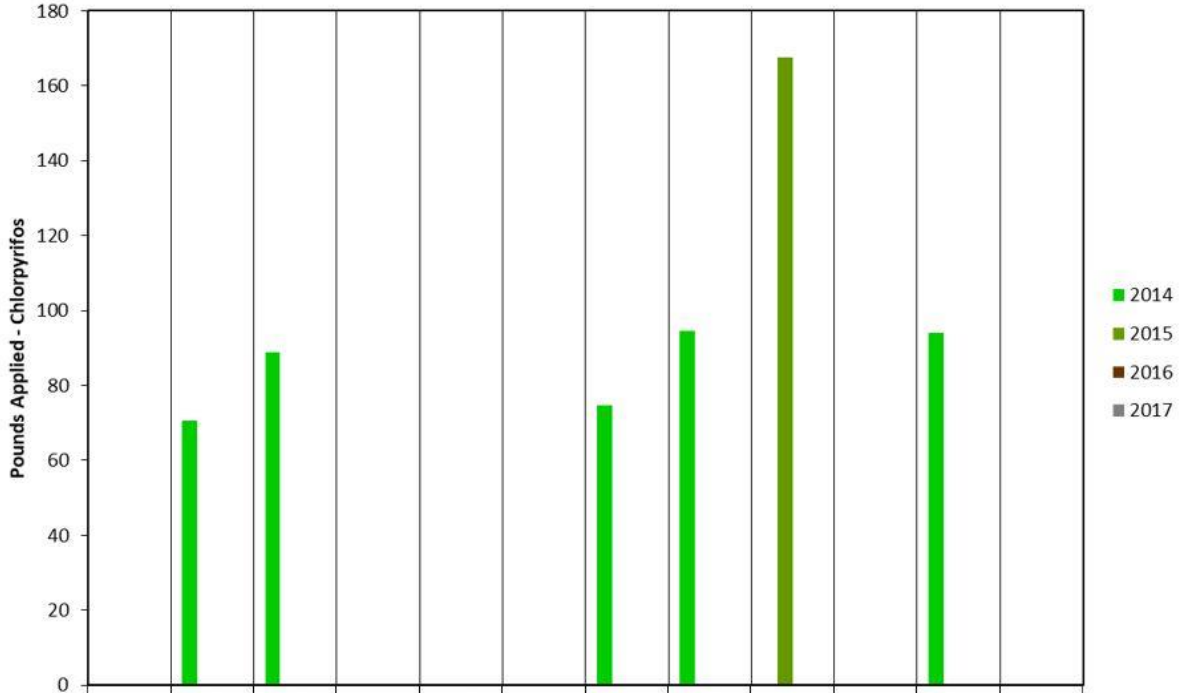
The Coalition does not conduct MPM for field parameters (DO and SC), *E. coli*, metals not applied by agriculture (arsenic), or legacy pesticides (DDE); however, monitoring for field parameters occurs on all sampling events. In the 2019 WY, the Coalition will conduct MPM for chlorpyrifos, water column toxicity to *S. capricornutum*, and sediment toxicity to *H. azteca* at Union Island Drain @ Bonetti Rd.

Chlorpyrifos

Union Island Drain @ Bonetti Rd is in a management plan for chlorpyrifos due to an exceedance in January 2015. From October 2014 through January 2018, the Coalition monitored 41 times for chlorpyrifos at Union Island Drain @ Bonetti Rd; a single exceedance occurred in January 2015. Since the exceedance, the Coalition has monitored 37 times with no detections. The PUR data indicate no use of chlorpyrifos in the site subwatershed since 2015 (Figure 23). In the 2019 WY, the Coalition will continue MPM for chlorpyrifos in January.

Figure 23. Union Island Drain @ Bonetti Rd chlorpyrifos use and monitoring history (2014-2017).

Shaded cells represent months of past monitoring. "X" indicates months in which exceedances occurred. Striped cells indicate where scheduled monitoring has not yet occurred.



Monitoring Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2014												
2015	X											
2016												
2017												
2018										2019WY		
Total Use (2014-2017)	0	71	89	0	0	0	75	95	168	0	94	0
% Total (2014-2017)	***0%***	***12%***	***15%***	***0%***	***0%***	***0%***	***13%***	***16%***	***28%***	***0%***	***16%***	***0%***
Total Use (2015-2017)	0	0	0	0	0	0	0	0	168	0	0	0
% Total (2015-2017)	***0%***	***0%***	***0%***	***0%***	***0%***	***0%***	***0%***	***0%***	***100%***	***0%***	***0%***	***0%***

Water Column Toxicity to *C. dubia*

The Coalition assessed the potential need for monitoring for water column toxicity to *C. dubia* at Union Island Drain @ Bonetti Rd based on the management plan at the Core site. From October 2014 through March 2018, the Coalition monitored 42 times for water column toxicity to *C. dubia* at Union Island Drain @ Bonetti Rd; no toxicity occurred. Due to sufficient monitoring history with no toxicity, the Coalition received approval to complete the management plan for water column toxicity to *C. dubia* in the Union Island Drain @ Bonetti Rd site subwatershed in February 2018. Therefore, the Coalition will not monitor for water column toxicity to *C. dubia* in this site subwatershed in the 2019 WY.

Water Column Toxicity to *S. capricornutum*

From October 2014 through May 2018, the Coalition monitored 43 times for water column toxicity to *S. capricornutum* at Union Island Drain @ Bonetti Rd; toxicity occurred in 16 samples. The Coalition initiated focused outreach in 2017 to address recurring algae toxicity in the site subwatershed. In the 2019 WY, the Coalition will continue MPM for water column toxicity to *S. capricornutum* in the Union Island Drain @ Bonetti Rd site subwatershed during January through July, September, October, and December.

Sediment Toxicity to *H. azteca*

From April 2015 through March 2018, the Coalition monitored seven times for sediment toxicity to *H. azteca* at Union Island Drain @ Bonetti Rd; toxicity occurred in two samples. In the 2019 WY, the Coalition will continue MPM for sediment toxicity to *H. azteca* in March and September.